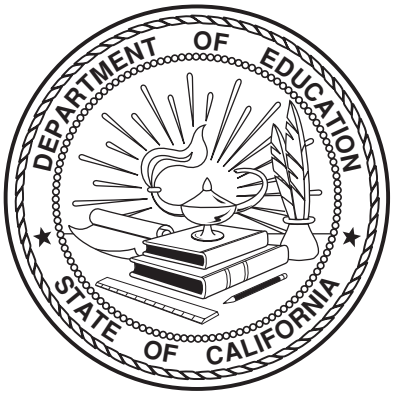
2011
California Physical Fitness Test



Reference Guide

- Fitness Areas and Tests
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Prepared by the

California Department of Education

Available on the California Physical Fitness Test Web site at http://www.pftdata.org/

2011 Physical Fitness Test Reference Guide

The "2011 Physical Fitness Test: Reference Guide" is designed to assist staff in all local educational agencies[1] (LEAs) become familiar with the California Physical Fitness Test (PFT). This guide includes a detailed description of each fitness area tested, the related performance criteria, and suggestions for facilitating the administration of each test. It may be used in conjunction with the "*FITNESSGRAM*® Fitness Areas, Test Options, and Equipment" chart found on the California Department of Education (CDE) PFT Program Resources Web page at http://www.cde.ca.gov/ta/tg/pf/pftresources.asp. Please note that this guide is not designed as a replacement for the *FITNESSGRAM*®/ *ACTIVITYGRAM*® Test Administration Manual (Updated Fourth Edition)[2].

Background

The PFT provides information that can be used by students to assess and plan personal fitness programs; by teachers to design the curriculum of physical education programs; and by parents and guardians to understand their children's fitness levels. This program also produces results that are used to monitor changes in the physical fitness of California students. By statute (California *Education Code* Section 60800), all LEAs in California are required to administer the PFT annually to all students in grades five, seven, and nine.

The State Board of Education designated the *FITNESSGRAM*® as the PFT for students in California public schools. The *FITNESSGRAM*® is a comprehensive, health-related physical fitness battery developed by The Cooper Institute. The primary goal of the *FITNESSGRAM*® is to assist students in establishing lifetime habits of regular physical activity.

FITNESSGRAM®

The *FITNESSGRAM*® is designed to assess six key fitness areas that represent three broad components of fitness: (1) aerobic capacity, (2) body composition, and (3) muscle strength, endurance, and flexibility. The third component is further divided into four areas: abdominal strength and endurance, trunk extensor strength and flexibility, upper body strength and endurance, and flexibility.

Performance Standards

The *FITNESSGRAM*® uses health-related standards to evaluate performance. The desired performance standard for each fitness-area test is the Healthy Fitness Zone® (HFZ®). This standard represents the level of fitness associated with good health. Students should strive to achieve a score within the HFZ® for each fitness-area test.

The *FITNESSGRAM*® performance standards are updated on a regular basis. The current year standards should always be used and are included in tables throughout this reference guide and posted as stand-alone versions at the CDE PFT *FITNESSGRAM*®: Healthy Fitness Zone® Charts Web page at http://www.cde.ca.gov/ta/tg/pf/healthfitzones.asp.

[1] Throughout this manual, LEAs include school districts, county offices of education, and charter schools that are independent for assessment purposes (i.e., independent charter schools).

[2] Throughout this manual, the *FITNESSGRAM*®/ *ACTIVITYGRAM*® Test Administration Manual (Updated Fourth Edition) will be referred to as the *FITNESSGRAM*® Test Administration Manual.

Each student's performance is classified into the HFZ® or other zones, depending on the fitness area, as follows:

Aerobic Capacity

- Healthy Fitness Zone®
- Needs Improvement – Some Risk
- Needs Improvement – High Risk

Body Composition

- Very Lean
- Healthy Fitness Zone®
- Needs Improvement – Some Risk
- Needs Improvement – High Risk

Muscle Strength, Endurance, and Flexibility

- Healthy Fitness Zone®
- Needs Improvement

The Needs Improvement (NI) designation signifies a fitness area where the student's score is not in the HFZ® and where the student would benefit from physical activities designed to improve performance in the designated fitness area. NI – Some Risk specifically indicates the student should continue to work to achieve the HFZ®. NI – High Risk specifically indicates increased health risks due to the student's level of fitness.

It is also possible that some students' scores exceed[3] the HFZ®. For Body Composition, this is designated as in the Very Lean zone. It is important that students and their parents or guardians be aware if Body Composition scores place them in the Very Lean zone.

For 2010-11, Human Kinetics has revised the HFZ® ranges for Aerobic Capacity and Body Composition. These revisions have (1) strengthened the comparability of the results from the different test options within Aerobic Capacity and Body Composition, and (2) raised the scores required to achieve the HFZ® for these two fitness areas. Be sure to use the 2011 version of the HFZ® charts located at the CDE PFT *FITNESSGRAM*®: Healthy Fitness Zone® Charts Web page at http://www.cde.ca.gov/ta/tg/pf/healthfitzones.asp.

This Reference Guide describes the six fitness areas tested by the PFT. Following each description are tables that display the data collection requirements and performance standards by age and gender.

Fitness Areas and Tests

Aerobic Capacity

The Aerobic Capacity fitness area refers to the maximum rate that oxygen can be taken into and used by the body during exercise, which is reported as a VO_2max[4] score. Aerobic Capacity is considered important because of the research that associates good aerobic capacity in adults with a reduction in many health problems. Three test options are provided to estimate aerobic capacity: One-Mile Run, 20-meter (m) Progressive Aerobic Cardiovascular Endurance Run (PACER), and Walk Test.

In 2011, all three Aerobic Capacity test options (i.e., One-Mile Run, 20m PACER, and Walk Test) will be reported in terms of VO_2max (Table 1). To calculate VO_2max for the One-Mile Run, in addition to gender, age, and time, the student's height and weight must be provided. Similarly, to calculate VO_2max for the 20m PACER, the student's height and weight will be needed along with gender, age, and number of laps completed. While the Walk Test has always been scored in terms of VO_2max, the heart rate must now be reported as the number of beats per minute rather than beats per 15 minutes.

For most students, these additional data requirements will not require additional data collection as their height and weight are probably

[3] For the PFT, the CDE considers students who exceed the HFZ® as meeting the HFZ®.

[4] VO_2max refers to the maximum oxygen consumption of an individual during exercise. The acronym is derived from V = volume per time; O_2 = oxygen; and max = maximum.

already collected for calculating their Body Mass Index (BMI). The Cooper Institute has developed HFZ® Look-Up Tables to allow teachers to quickly estimate the student's BMI and VO_2max scores for the One-Mile Run or 20m PACER. These tables can be found on the Cooper Institute, Youth Zone, *FITNESSGRAM*®, New *FITNESSGRAM*® Healthy Fitness Zone® Standards Web page at http://www.cooperinstitute.org/youth/fitnessgram/fitness-standards.cfm (Outside Source).

Administration Tips for the Aerobic Capacity Tests

- Preparation for any of the tests should include instructions and practice in pacing and in techniques for heart rate monitoring.
- Adequate time should be allowed for students to warm up before taking a test and to cool down after completing the test.
- To avoid potential health and safety issues with students and invalid estimates, do not administer a test in unusually high temperatures or humidity or when the wind is strong.

The HFZs® for the Aerobic Capacity test options of the One-Mile Run and 20m PACER begin with age ten (Table 1) and those for the Walk Test begin with age thirteen. HFZs® for students under the age of ten are not available.

Table 1. HFZs® for Aerobic Capacity

Aerobic Capacity						
One-Mile Run / 20m PACER / Walk Test VO_2max						
	Females			Males		
Age	NI – High Risk	NI – Some Risk	HFZ®	NI – High Risk	NI – Some Risk	HFZ®
5	VO_2max standards not available for students ages 5 through 9. **For Walk Test only, standards also not available for students ages 10, 11, and 12.**					
6						
7						
8						
9						
10	≤ 37.3	37.4 – 40.1	≥ 40.2	≤ 37.3	37.4 – 40.1	≥ 40.2
11	≤ 37.3	37.4 – 40.1	≥ 40.2	≤ 37.3	37.4 – 40.1	≥ 40.2
12	≤ 37.0	37.1 – 40.0	≥ 40.1	≤ 37.6	37.7 – 40.2	≥ 40.3
13	≤ 36.6	36.7 – 39.6	≥ 39.7	≤ 38.6	38.7 – 41.0	≥ 41.1
14	≤ 36.3	36.4 – 39.3	≥ 39.4	≤ 39.6	39.7 – 42.4	≥ 42.5
15	≤ 36.0	36.1 – 39.0	≥ 39.1	≤ 40.6	40.7 – 43.5	≥ 43.6
16	≤ 35.8	35.9 – 38.8	≥ 38.9	≤ 41.0	41.1 – 44.0	≥ 44.1
17	≤ 35.7	35.8 – 38.7	≥ 38.8	≤ 41.2	41.3 – 44.1	≥ 44.2
17+	≤ 35.3	35.4 – 38.5	≥ 38.6	≤ 41.2	41.3 – 44.2	≥ 44.3

≥ The score is greater than or equal to the indicated value.
≤ The score is less than or equal to the indicated value.

One-Mile Run. The One-Mile Run (Figure 1) estimates aerobic capacity from running performance. Students are instructed to run a mile as fast as possible. Walking is permitted for students who cannot run the total distance. The time taken to complete the run is recorded in minutes and seconds. Students who attempt the One-Mile Run and do not complete it should be marked with a code of 59 minutes and 59 seconds and will be scored Incomplete.

Figure 1. One-Mile Run

The PFT data collection requirements, including the acceptable values, for the One-Mile Run are shown in Table 2. The equation used for estimating VO_2max for the One-Mile Run is provided in Figure 2.

Figure 2. Equation for Estimating VO_2max for the One-Mile Run and 20m PACER[5,6]

VO_2max = (.21 * age * gender) – (.84 * BMI) – (8.41 * time) + (.34 * time * time) + 108.94

- Gender = 1 for males and 0 for females
- Time[7] is in minutes (Convert One-Mile Run time from minutes and seconds to minutes for use in this equation by dividing the seconds by 60 and adding the resulting decimal to the minutes.)
- BMI[8] is Body Mass Index

* signifies multiplication

Table 2. PFT Data Collection Requirements for the One-Mile Run

Data	Gender	Age	Time (minutes)	Time (seconds)	Height (feet)	Height (inches)	Weight (pounds)
Acceptable Values	M or F	✓*	3 – 59	0 – 59	1 – 7	0 – 11	1 – 500

* Age requires collecting the student's date of birth and first day of testing.

[5] Cureton, K.J., Sloniger, M.A., O'Bannon, J.P., Black, D.M., McCormack, W.P. (1995). A generalized equation for the prediction of VO_2 peak from one-mile run/walk performance. *Medicine and Science in Sports and Exercise*, *27*, 445–451.

[6] A student's VO_2max will not be estimated if the student's One-Mile Run time exceeds 13 minutes.

[7] One-Mile Run time = One-Mile Run minutes + (One-Mile Run seconds/60) [convert One-Mile Run time to a decimal]

[8] BMI = Weight / (Height * Height)
Height = .3048 * (feet) + .0254 * (inches) [convert height in feet and inches to meters]
Weight = 0.45359237 * (pounds) [convert weight in pounds to kilograms]

20m PACER or Progressive Aerobic Cardiovascular Endurance Run. The 20m PACER (Figure 3) estimates aerobic capacity from the number of laps (20m in distance) that are completed. Unlike the other two Aerobic Capacity options, the PACER starts out easy and becomes progressively more difficult. Students are instructed to run as long as possible across a distance and at a specified pace set to music played from a tape or CD. For this test, a set of parallel lines is drawn 20 meters apart. Students start on one line, run the distance, and touch the opposite line with one foot. Once they hear the sound of a single beep, students turn around and run back to the starting line. Every minute, indicated by a triple beep, the pace gets faster. Students continue in this manner until they fail twice to touch the line before they hear the single beep.

There is a 15m PACER for use with elementary or middle school students and only if there is no access to space that accommodates the 20m version. There are **no** HFZs® for Aerobic Capacity based on the 15m PACER (Table 1); therefore, if the 15m PACER is administered, these scores must be converted to 20m scores, as shown in the following example:

- A female student, age 12, completes 16 laps on the 15m PACER. This is the equivalent of 12 laps on the 20m PACER, which is the score that is recorded for this student.

Figure 3. 20m PACER

The 15m to 20m PACER conversion table can be viewed and downloaded from the Human Kinetics *FITNESSGRAM*® PACER Conversion Web document at http://www.fitnessgram.net/PACER_Conversion.pdf (Outside Source) or found in the *FITNESSGRAM*® Test Administration Manual.

The PFT data collection requirements, including the acceptable values, for the 20m PACER are shown in Table 3.

The equation used to calculate VO_2max for the One-Mile Run also is used for the 20m PACER (Figure 2). However, before this equation can be applied to the 20m PACER, lap scores from the 20m PACER need to be converted to a One-Mile Run time using the 20m PACER to One-Mile Run Time Conversion Table provided at the end of this document.

Note: There is no One-Mile Run time equivalent for students who complete less than ten 20m PACER laps; therefore, students who complete less than ten laps will receive a NI designation.

Table 3. PFT Data Collection Requirements for the 20m PACER

Data	Gender	Age	Laps (number)	Height (feet)	Height (inches)	Weight (pounds)
Acceptable Values	M or F	✓*	1 – 190	1 – 7	0 – 11	1 – 500

* Age requires collecting the student's date of birth and first day of testing.

Walk Test. The Walk Test (Figure 4) is only for use with students who are ages 13 or older. This test estimates aerobic capacity from heart rate response to a one-mile walk. Students are instructed to walk one mile as fast as possible. Immediately after the walk, the heart rate is determined. This heart rate (heart beats per minute) is used along with the total walk time (minutes and seconds) and the weight of the student to estimate aerobic capacity. Students who attempt the Walk Test and do not complete it should be marked with a code of 59 minutes and 59 seconds and will be scored Incomplete.

Figure 4. One-Mile Walk

The PFT data collection requirements, including the acceptable values, for the Walk Test are shown in Table 4. The equation used for estimating VO_2max for the Walk Test is provided in Figure 5.

Figure 5. Rockport Fitness Test Equation for Estimating VO_2max for the Walk Test[9]

VO_2max = 132.853 + (6.315 * gender) – (.0769 * weight) – (.3877 * age) – (3.2649 * time) – (.1565 * heart rate)

- Gender = 1 for males and 0 for females
- Weight is in pounds
- Time[10] is in minutes (Convert Walk Test time from minutes and seconds to minutes for use in this equation by dividing the seconds by 60 and adding the resulting decimal to the minutes.)
- Heart rate is beats per minute

* signifies multiplication

Body Composition

The Body Composition fitness area targets the various factors that contribute to an individual's total weight (i.e., percent of muscle, bone, organ, and fat content). Body Composition tests estimate the level of body fat. This component of fitness is considered important because excessive fat content is associated with health problems, such as coronary heart disease, stroke, and diabetes. *FITNESSGRAM*® provides three test options to estimate body composition: Skinfold Measurements, Bioelectric Impedance Analyzer, and Body Mass Index.

The HFZs® for the body composition test options all begin with age five (Tables 7 and 9). These standards reflect the natural developmental trends

Table 4. PFT Data Collection Requirements for the Walk Test

Data	Gender	Age	Time (minutes)	Time (seconds)	Heart Rate (# beats per minute)	Weight (pounds)
Acceptable Values	M or F	✓*	3 – 59	0 – 59	30 – 250	1 – 500

* Age requires collecting the student's date of birth and first day of testing.

[9] Kline, G.M., Porcari, J.P, Hintermeister, R., Freedson, P.S., Ward, A., McCarron, R.F. et al. (1987). Estimation of VO_2max from a one-mile track walk, gender, age, and body weight. *Medicine and Science in Sports and Exercise, 19*(3), 253–259.

[10] Walk Test time = Walk Test minutes + Walk Test seconds/60 [convert Walk Test time to decimal]

for females and males, with boys gaining muscle with age and girls tending to gain body fat through the adolescent years.

Administration Tips for the Body Composition Tests

- Privacy should be provided to the student when measuring a student's height and/or weight.
- Be sure the examiner has practiced taking skinfold measurements.
- As often as possible, the same examiner should administer the skinfold measurements to the same students at subsequent tests.

Skinfold Measurements. Skinfold Measurements (Figure 6) estimates body fat by taking the median or middle value from three ordered measurements of the thickness of skinfolds on the triceps and calf of the right side of the body. A device called a skinfold caliper is used to take these measurements. Using the Body Composition Conversion Chart (found in the *FITNESSGRAM*® Test Administration Manual), the measurements are converted to percentages of body fat. The CDE also accepts measurements of body fat obtained from automated skinfold calipers. Automated skinfold calipers are computerized devices used to acquire, calculate, and display the percentage of body fat together with computer-entered data, such as age and gender.

The PFT data collection requirements, including the acceptable values, for Skinfold Measurements are shown in Table 5. The equations used for estimating percent body fat for Skinfold Measurements are provided in Figure 7.

Figure 6. Skinfold Measurements

Figure 7. Equations for Estimating Percent Body Fat[11]

Boys percent body fat = (0.735 * [triceps value + calf value]) + 1.0

Girls percent body fat = (0.610 * [triceps value + calf value]) + 5.0

- Triceps value = median value from three skinfold measurements from triceps site
- Calf value = median value from three skinfold measurements from calf site

* signifies multiplication

Table 5. PFT Data Collection Requirements for the Skinfold Measurement

Data	Gender	Age	Triceps (median value in millimeters)	Calf (median value in millimeters)
Acceptable Values	M or F	✓*	1 – 40	1 – 40

*Age requires collecting the student's date of birth and first day of testing.

[11] Slaughter, M.H., Lohman, T.G., Boileau, R.A., Horswill, C.A., Stillman, R.J., Van Loan, M.D., & Bemben, D.A. (1988). Skinfold equations for estimation of body fatness in children and youth. *Human Biology, 60*, 709-723.

Bioelectric Impedance Analyzer (BIA). The BIA (Figure 8) measures resistance to the flow of an electrical signal in the body. The device sends a safe, low energy electrical signal through the body and generates an index of resistance. This resistance value is used by the device along with other values such as height, weight, age, and gender to generate an estimate the percentage of body fat. There are various BIA devices available that are affordable, easy to use, and accurate enough for use on the *FITNESSGRAM*®. (While height and weight are required to be inserted into the BIA for the device to calculate the percentage of body fat, for CDE data collection requirements, it is only the percent body fat, to the nearest tenth of a decimal, that is reported.)

The PFT data collection requirements, including the acceptable values, for BIAs are shown in Table 6.

Table 6. PFT Data Collection Requirements for BIAs

Data	Gender	Age	Percent Body Fat (nearest tenth of a decimal)
Accepted Values	M or F	✓*	0.1 – 99.9

* Age requires collecting the student's date of birth and first day of testing.

Figure 8. Bioelectric Impedance Analyzer

Table 7. HFZs® for Percent of Body Fat[12]

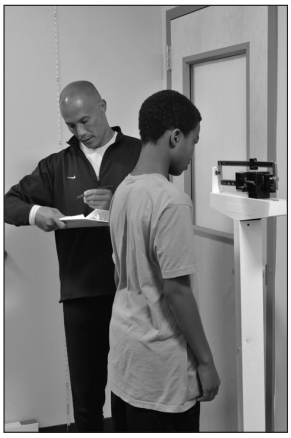
Body Composition Percent Body Fat								
	Females				Males			
Age	NI – High Risk	NI – Some Risk	HFZ®	Very Lean	NI – High Risk	NI – Some Risk	HFZ®	Very Lean
5	≥ 28.4	≥ 20.9	20.8 – 9.8	≤ 9.7	≥ 27.0	≥ 18.9	18.8 – 8.9	≤ 8.8
6	≥ 28.4	≥ 20.9	20.8 – 9.9	≤ 9.8	≥ 27.0	≥ 18.9	18.8 – 8.5	≤ 8.4
7	≥ 28.4	≥ 20.9	20.8 – 10.1	≤ 10.0	≥ 27.0	≥ 18.9	18.8 – 8.3	≤ 8.2
8	≥ 28.4	≥ 20.9	20.8 – 10.5	≤ 10.4	≥ 27.0	≥ 18.9	18.8 – 8.4	≤ 8.3
9	≥ 30.8	≥ 22.7	22.6 – 11.0	≤ 10.9	≥ 30.1	≥ 20.7	20.6 – 8.7	≤ 8.6
10	≥ 33.0	≥ 24.4	24.3 – 11.6	≤ 11.5	≥ 33.2	≥ 22.5	22.4 – 8.9	≤ 8.8
11	≥ 34.5	≥ 25.8	25.7 – 12.2	≤ 12.1	≥ 35.4	≥ 23.7	23.6 – 8.8	≤ 8.7
12	≥ 35.5	≥ 26.8	26.7 – 12.7	≤ 12.6	≥ 35.9	≥ 23.7	23.6 – 8.4	≤ 8.3
13	≥ 36.3	≥ 27.8	27.7 – 13.4	≤ 13.3	≥ 35.0	≥ 22.9	22.8 – 7.8	≤ 7.7
14	≥ 36.8	≥ 28.6	28.5 – 14.0	≤ 13.9	≥ 33.2	≥ 21.4	21.3 – 7.1	≤ 7.0
15	≥ 37.1	≥ 29.2	29.1 – 14.6	≤ 14.5	≥ 31.5	≥ 20.2	20.1 – 6.6	≤ 6.5
16	≥ 37.4	≥ 29.8	29.7 – 15.3	≤ 15.2	≥ 31.6	≥ 20.2	20.1 – 6.5	≤ 6.4
17	≥ 37.9	≥ 30.5	30.4 – 15.9	≤ 15.8	≥ 33.0	≥ 21.0	20.9 – 6.7	≤ 6.6
17+	≥ 38.6	≥ 31.4	31.3 – 16.5	≤ 16.4	≥ 35.1	≥ 22.3	22.2 – 7.0	≤ 6.9

≥ The score is greater than or equal to the indicated value.
≤ The score is less than or equal to the indicated value.

[12] A body fat percentage that falls below the range included in the HFZ® is identified as Very Lean. Although the CDE considers these scores to be in the HFZ®, students falling into the very low category should be informed of this designation and told that being too lean may not be best for optimal health.

Body Mass Index. The Body Mass Index (Figure 9), which is commonly referred to as the BMI, is not an estimate of body fat. Instead, it provides information on the appropriateness of a student's weight relative to his or her height. The Body Mass Index is not the recommended body composition test particularly for some students with high muscle mass; however, it is available because there may be LEA policies limiting skinfold measurements.

Figure 9. Body Mass Index



The PFT data collection requirements, including the acceptable values, for Body Mass Index are shown in Table 8. The height and weight data is also used in the estimation of VO_2max for the One-Mile Run and 20m PACER. The equation used for estimating Body Mass Index is provided in Figure 10.

Figure 10. Equation for Estimating Body Mass Index

BMI = Weight / (Height * Height)

- Height = .3048 * (feet) + .0254 * (inches) [convert height in feet and inches to meters]
- Weight = 0.45359237 * (pounds) [convert weight in pounds to kilograms]

* signifies multiplication

Table 8. PFT Data Collection Requirements for Body Mass Index

Data	Gender	Age	Height (feet)	Height (inches)	Weight (pounds)
Acceptable Values	M or F	✓*	1 – 7	0 – 11	1 – 500

* Age requires collecting the student's date of birth and first day of testing.

Table 9. HFZs® for Body Mass Index[13]

Body Composition Body Mass Index								
	Females				Males			
Age	NI – High Risk	NI – Some Risk	HFZ®	Very Lean	NI – High Risk	NI – Some Risk	HFZ®	Very Lean
5	≥ 17.3	≥ 16.8	16.7 – 13.6	≤ 13.5	≥ 17.5	≥ 16.8	16.7 – 13.9	≤ 13.8
6	≥ 17.7	≥ 17.1	17.0 – 13.5	≤ 13.4	≥ 17.8	≥ 17.0	16.9 – 13.8	≤ 13.7
7	≥ 18.3	≥ 17.6	17.5 – 13.5	≤ 13.4	≥ 18.3	≥ 17.4	17.3 – 13.8	≤ 13.7
8	≥ 19.1	≥ 18.3	18.2 – 13.6	≤ 13.5	≥ 19.0	≥ 17.9	17.8 – 13.9	≤ 13.8
9	≥ 20.0	≥ 19.0	18.9 – 13.8	≤ 13.7	≥ 19.9	≥ 18.6	18.5 – 14.1	≤ 14.0
10	≥ 21.0	≥ 19.6	19.5 – 14.1	≤ 14.0	≥ 20.8	≥ 19.0	18.9 – 14.3	≤ 14.2
11	≥ 21.9	≥ 20.5	20.4 – 14.5	≤ 14.4	≥ 21.8	≥ 19.8	19.7 – 14.6	≤ 14.5
12	≥ 22.9	≥ 21.3	21.2 – 14.9	≤ 14.8	≥ 22.7	≥ 20.6	20.5 – 15.1	≤ 15.0
13	≥ 23.8	≥ 22.1	22.0 – 15.4	≤ 15.3	≥ 23.6	≥ 21.4	21.3 – 15.5	≤ 15.4
14	≥ 24.6	≥ 22.9	22.8 – 15.9	≤ 15.8	≥ 24.5	≥ 22.2	22.1 – 16.1	≤ 16.0
15	≥ 25.4	≥ 23.6	23.5 – 16.4	≤ 16.3	≥ 25.3	≥ 23.0	22.9 – 16.6	≤ 16.5
16	≥ 26.1	≥ 24.2	24.1 – 16.9	≤ 16.8	≥ 26.0	≥ 23.8	23.7 – 17.2	≤ 17.1
17	≥ 26.7	≥ 24.7	24.6 – 17.3	≤ 17.2	≥ 26.7	≥ 24.5	24.4 – 17.8	≤ 17.7
17+	≥ 27.2	≥ 25.2	25.1 – 17.6	≤ 17.5	≥ 27.5	≥ 25.2	25.1 – 18.3	≤ 18.2

≥ The score is greater than or equal to the indicated value.
≤ The score is less than or equal to the indicated value.

[13] A Body Mass Index, or BMI, that falls below the range included in the HFZ® is identified as Very Lean. Although the CDE considers these scores to be in the HFZ®, students falling into the very low category should be informed of this designation and told that being too lean may not be best for optimal health.

Muscle Strength, Endurance, and Flexibility

The muscle strength, endurance, and flexibility fitness area determines the health status of the musculoskeletal system (i.e., muscles and bones throughout the body). Balanced, healthy functioning of this system requires that muscles work forcefully (i.e., strength), over a period of time (i.e., endurance), and be flexible enough to have a full range of motion at the joints (i.e., flexibility). This component of fitness is important, because it can reduce potential restrictions in independent living as adults (e.g., chronic lower back pain).

To determine the health level of the musculoskeletal system, four major areas are tested: (1) abdominal strength and endurance, (2) trunk extensor strength and flexibility, (3) upper body strength and endurance, and (4) flexibility.

Abdominal Strength and Endurance

Abdominal strength and endurance are important in promoting good posture and correct pelvic alignment. The latter is important in the maintenance of lower back health. The Curl-Up (Figure 11) is the only test that is used to determine this area of fitness.

Curl-Up. Students are to complete as many Curl-Ups as possible (to a maximum of 75), at a specified pace of about one Curl-Up every three seconds. The pace should be called or played on a prerecorded tape or CD. The *FITNESSGRAM*® Test Administration Manual supplies a CD with cadences for the Curl-Up. (Cadences help students with pacing their movements.) On a mat, students lie on their backs with their knees bent at a 140° angle, feet flat on the mat and their hands at their sides, palms face down. Moving slowly, students curl up, sliding fingers across a measuring strip on the mat, and then curl back down until the head touches the mat. Students are stopped after reaching 75 Curl-Ups, when the second form break occurs, or at four minutes.

Administration Tips for the Curl-Up

- Allow students to practice and learn the correct Curl-Up form.
- Curl-Up movements should be rhythmical (i.e., with the cadence) and continuous. Pauses and rest periods are not allowed.
- Students should reposition themselves if the body moves and the head does not contact the mat at the appropriate spot or the measuring strip moves out of position.
- Students should be stopped after four minutes.

Figure 11. Curl-Up

The PFT data collection requirements, including the acceptable values, for the Curl-Up are shown in Table 10. The HFZs® for the Curl-Up are shown in Table 11.

Table 10. PFT Data Collection Requirements for the Curl-Up

Data	Gender	Age	Curl-Ups (# completed)
Acceptable Values	M or F	✓*	1 – 75

* Age requires collecting the student's date of birth and first day of testing.

Table 11. HFZs® for the Curl-Up

Abdominal Strength and Endurance		
Curl-Up (# completed)		
Age	Females	Males
5	≥ 2	≥ 2
6	≥ 2	≥ 2
7	≥ 4	≥ 4
8	≥ 6	≥ 6
9	≥ 9	≥ 9
10	≥ 12	≥ 12
11	≥ 15	≥ 15
12	≥ 18	≥ 18
13	≥ 18	≥ 21
14	≥ 18	≥ 24
15	≥ 18	≥ 24
16	≥ 18	≥ 24
17	≥ 18	≥ 24
17+	≥ 18	≥ 24

≥ The score is greater than or equal to the indicated value.

Trunk Extensor Strength and Flexibility

Trunk extensor strength and flexibility is an important component of fitness, because it predicts first time and recurrent lower back pain – a major source of disability and discomfort in the United States. Although risks of developing back pain are greater with age, awareness and attention to trunk musculature at an early age is important to reduce future risks. The Trunk Lift (Figure 12) is the only test used to determine this area of fitness.

Figure 12. Trunk Lift

Trunk Lift. While lying face down on a mat, students are asked to slowly lift the upper body off the floor, using the muscles of the back, to a maximum of 12 inches. Students need to hold the position for measurement (i.e., distance from the floor to the student's chin), which is recorded in whole inches only. During the test, students should be instructed to keep their eyes focused on a spot on the floor. Once the measurement is made, the student returns to the starting position. A second trial is conducted, and the highest score is recorded.

Administration Tips for the Trunk Lift

- Students should not bounce during the test.
- Providing a spot on the floor for the student to focus on should assist the student in maintaining the head in the proper position.
- As a safety precaution, students should **not** be encouraged to lift higher than 12 inches since excessive arching of the back may harm the student by compressing the intervertebral disks.

The PFT data collection requirements, including the acceptable values, for the Trunk Lift are shown in Table 12. The HFZs® for the Trunk Lift are shown in Table 13.

Table 12. PFT Data Collection Requirements for the Trunk Lift

Data	Gender	Age	Trunk Lift (# of inches)
Acceptable Values	M or F	✓*	0 – 12

* Age requires collecting the student's date of birth and first day of testing.

Table 13. HFZs® for the Trunk Lift

Trunk Extensor Strength and Flexibility		
Trunk Lift (# of inches)		
Age	Females	Males
5	6 – 12	6 – 12
6	6 – 12	6 – 12
7	6 – 12	6 – 12
8	6 – 12	6 – 12
9	6 – 12	6 – 12
10	9 – 12	9 – 12
11	9 – 12	9 – 12
12	9 – 12	9 – 12
13	9 – 12	9 – 12
14	9 – 12	9 – 12
15	9 – 12	9 – 12
16	9 – 12	9 – 12
17	9 – 12	9 – 12
17+	9 – 12	9 – 12

Upper Body Strength and Endurance

Upper body strength and endurance is an important fitness area that contributes to the maintenance of functional health and good posture. Three options are available to determine upper body strength: Push-Up, Modified Pull-Up, and Flexed-Arm Hang.

90º Push-Up. Students are instructed to complete as many 90º Push-Ups (Figure 13) as possible at a specified pace (of about one push-up every three seconds), up to a maximum of 75. The pace should be called or played on a prerecorded tape or CD. The *FITNESSGRAM*® Test Administration Manual supplies a CD with cadence for the Push Up. (Cadences help students with pacing their movements.) Students are stopped after reaching 75 Push-Ups, when the second form break occurs, at four minutes, or when they experience extreme discomfort or pain.

Administration Tips for the Push-Up

- Allow students to practice and learn the correct 90º Push-Up form.
- Females and males follow the same protocol.

The PFT data collection requirements, including the acceptable values, for the 90º Push-Up are shown in Table 14. The HFZs® for the Push-Up are shown in Table 15.

Figure 13. 90° Push-Up

Table 14. PFT Data Collection Requirements for the 90º Push-Up

Data	Gender	Age	90º Push-Up (# completed)
Acceptable Values	M or F	✓*	1–75

* Age requires collecting the student's date of birth and first day of testing.

Table 15. HFZs® for the 90º Push-Up

Upper Body Strength and Endurance		
90º Push-Up (# completed)		
Age	Females	Males
5	≥ 3	≥ 3
6	≥ 3	≥ 3
7	≥ 4	≥ 4
8	≥ 5	≥ 5
9	≥ 6	≥ 6
10	≥ 7	≥ 7
11	≥ 7	≥ 8
12	≥ 7	≥ 10
13	≥ 7	≥ 12
14	≥ 7	≥ 14
15	≥ 7	≥ 16
16	≥ 7	≥ 18
17	≥ 7	≥ 18
17+	≥ 7	≥ 18

≥ The score is greater than or equal to the indicated value.

Modified Pull-Up. For the Modified Pull-Up (Figure 14), students are instructed to successfully complete as many Modified Pull-Ups as possible. Students perform the Modified Pull-Up by lying on their backs directly under a bar. Students grasp the bar and pull up their upper bodies until the chin reaches a specified level, marked by an elastic band. Students are stopped when the second form break occurs. The number of Modified Pull-Ups is recorded.

Figure 14. Modified Pull-Up

Administration Tips for the Modified Pull-Up

- Only arm movement is allowed. The body should be kept straight.
- Movement should be rhythmical and continuous. Students may not stop to rest.

The PFT data collection requirements, including the acceptable values, for the Modified Pull-Up are shown in Table 16. The HFZs® for the Modified Pull-Up are shown in Table 17.

Table 16. PFT Data Collection Requirements for the Modified Pull-Up

Data	Gender	Age	Modified Pull-Up (# completed)
Acceptable Values	M or F	✓*	1-75

* Age requires collecting the student's date of birth and first day of testing.

Table 17. HFZs® for the Modified Pull-Up

Upper Body Strength and Endurance		
Modified Pull-Up (# completed)		
Age	Females	Males
5	≥ 2	≥ 2
6	≥ 2	≥ 2
7	≥ 3	≥ 3
8	≥ 4	≥ 4
9	≥ 4	≥ 5
10	≥ 4	≥ 5
11	≥ 4	≥ 6
12	≥ 4	≥ 7
13	≥ 4	≥ 8
14	≥ 4	≥ 9
15	≥ 4	≥ 10
16	≥ 4	≥ 12
17	≥ 4	≥ 14
17+	≥ 4	≥ 14

≥ The score is greater than or equal to the indicated value.

Flexed-Arm Hang. For the Flexed-Arm Hang (Figure 15), students are instructed to hang by the arms and with their chin above a bar as long as possible. Students are stopped when the chin drops below the bar or when the second form break occurs. The length of time hanging is recorded in seconds.

Administration Tips for the Flexed-Arm Hang

- The body should not swing during the test.
- Only one trial is permitted unless the examiner believes that the student has not had a fair opportunity to perform one trial.

The PFT data collection requirements, including the acceptable values, for the Flexed-Arm Hang are shown in Table 18. The HFZs® for the Flexed-Arm Hang are shown in Table 19.

Figure 15. Flexed-Arm Hang

Table 18. PFT Data Collection Requirements for the Flexed-Arm Hang

Data	Gender	Age	Flexed-Arm Hang (# of seconds)
Acceptable Values	M or F	✓*	0 – 90

* Age requires collecting the student's date of birth and first day of testing.

Table 19. HFZs® for the Flexed-Arm Hang

Upper Body Strength and Endurance		
Flexed-Arm Hang (# of seconds)		
Age	Females	Males
5	≥ 2	≥ 2
6	≥ 2	≥ 2
7	≥ 3	≥ 3
8	≥ 3	≥ 3
9	≥ 4	≥ 4
10	≥ 4	≥ 4
11	≥ 6	≥ 6
12	≥ 7	≥ 10
13	≥ 8	≥ 12
14	≥ 8	≥ 15
15	≥ 8	≥ 15
16	≥ 8	≥ 15
17	≥ 8	≥ 15
17+	≥ 8	≥ 15

≥ The score is greater than or equal to the indicated value.

Flexibility

Flexibility of the joints, both in the upper and lower body, is an important component of health-related fitness. People benefit from increased flexibility on a daily basis, both in routine tasks and those associated with more rigorous physical activity. Two options are available to determine a student's flexibility: Back-Saver Sit and Reach and Shoulder Stretch.

Back-Saver Sit and Reach. The Back-Saver Sit and Reach (Figure 16) predominantly measures the flexibility of the hamstring muscles. Students are instructed to reach the specified distance on the left **and** right sides of the body. Starting in a sitting position, with the left leg extended (the foot is touching the box needed for this test) and the right leg bent, the student reaches forward with both hands along the scale of the box. The student reaches four times and holds the position on the fourth reach for at least one second. The distance the student reaches is recorded to the nearest inch and to a maximum of 12 inches. To measure reach distance with the other side of the body, the same procedure is repeated with the extended and bent legs switched. The scores are recorded separately for the two sides of the body. To be in the HFZ® for the Back-Saver Sit and Reach, the student should meet the reach criteria using both the left **and** right sides of the body.

Administration Tips for the Back-Saver Sit and Reach

- The knee of the extended leg should remain straight. The examiner may place one hand on the student's knee as a reminder to keep the knee straight. As a safety precaution, care should be taken not to push or use force to hold down the student's knee.
- Hips must remain square to the box. Do not allow the student to turn the hip away from the box as he or she reaches.
- As a safety precaution, reach performance should be limited to 12 inches.

Figure 16. Back-Saver Sit and Reach

The PFT data collection requirements, including the acceptable values, for the Back-Saver Sit and Reach are shown in Table 20. The HFZs® for the Back-Saver Sit and Reach are shown in Table 21.

Table 20. PFT Data Collection Requirements for the Back-Saver Sit and Reach

Data	Gender	Age	Left Side (# of inches)	Right Side (# of inches)
Acceptable Values	M or F	✓*	0 – 12	0 – 12

* Age requires collecting the student's date of birth and first day of testing.

Table 21. HFZs® for the Back-Saver Sit and Reach

Flexibility		
Back-Saver Sit and Reach (# of inches)		
Age	Females	Males
5	9	8
6	9	8
7	9	8
8	9	8
9	9	8
10	9	8
11	10	8
12	10	8
13	10	8
14	10	8
15	12	8
16	12	8
17	12	8
17+	12	8

Shoulder Stretch. The Shoulder Stretch (Figure 17) measures upper body flexibility. Students are instructed to touch the fingertips together behind the back with one hand reaching over the shoulder and the other under the elbow. **Both** shoulders are tested and each is recorded separately.

The PFT data collection requirements, including the acceptable values, for the Shoulder Stretch are shown in Table 22. The HFZs® for the Shoulder Stretch are shown in Table 23.

Table 22. PFT Data Collection Requirements for the Shoulder Stretch

Data	Gender	Age	Left Side	Right Side
Acceptable Values	M or F	✓*	Yes or No	Yes or No

* Age requires collecting the student's date of birth and first day of testing.

Table 23. HFZs® for the Shoulder Stretch

Age	Females & Males
All	Touching the fingertips together behind the back on both the left **and** right sides.

Figure 17. Shoulder Stretch

General Suggestions for PFT Administration

Most of the *FITNESSGRAM*® tests can be administered in a space equivalent to the size of most classrooms. While the test options for Aerobic Capacity require the greatest amount of space, one of the options, the PACER, requires a space that can accommodate the 15m or 20m distance needed to carry out the test. Schools with limited space may consider using one of the following options:

- Classrooms, lunchrooms, auditoriums, or other similar spaces
- Physical education facilities on other school campuses
- Local park and recreation facilities

Testing Students with Disabilities

Certain variations or accommodations may be provided for students with disabilities who need special assistance on the PFT. Variations and accommodations should be specified in the student's individualized education program (IEP) or Section 504 plan. *Matrix 1. Matrix of Test Variations, Accommodations, and Modifications for Administration of California Statewide Assessments* provides a list of the types of variations and accommodations that are available for the PFT. This matrix is posted on the CDE Student Testing Web page at http://www.cde.ca.gov/ta/tg/sa/.

FITNESSGRAM® is intended for use with students with disabilities who do not require modifications. Teachers will, in some situations, be working with students with disabilities who do require modifications. If certain physical fitness components are deemed important as a dimension in physical education, they are equally important for all students. Therefore, teachers needing assistance with modifications should contact Linda Hooper, Education Research and Evaluation Consultant, by phone at 916-445-9449 or by e-mail at PFT@cde.ca.gov.

Administration Resources

The *FITNESSGRAM*® Test Administration Manual, software, and materials needed (i.e., skinfold calipers, Curl-Up measuring strips, and PACER CD) to administer the tests can be purchased from Human Kinetics by calling 800-747-4457, extension 2423. The manual includes a DVD of all the test protocols and a CD with the pace or cadences for the 15m and 20m PACER, Curl-Up, and Push-Up. In addition, due to the availability of the 15m PACER, there is a conversion table for converting the 15m laps to 20m laps for PACER scoring purposes. This conversion table can be viewed and downloaded from the Human Kinetics *FITNESSGRAM*® PACER Conversion Web document at http://www.fitnessgram.net/PACER_Conversion.pdf (Outside Source) or found in the *FITNESSGRAM*® Test Administration Manual.

More Information

More information about the PFT and the *FITNESSGRAM*® are available on the CDE-sponsored PFT Training Web site at http://www.pft-info.org/ (Outside Source). The PFT Training Web site contains videos and materials, which may be used by PFT coordinators and physical education teachers to better understand the content and requirements of the PFT and the *FITNESSGRAM*®.

20m PACER to One-Mile Run Time Conversion Table[1]

Calculating VO_2max for the 20m PACER involves the application of the same equation used to calculate VO_2max for the One-Mile Run (Figure 2). Before this equation can be applied to the 20m PACER, a lap score from the 20m PACER needs to be converted to a One-Mile Run time using the following conversion table.

20m PACER Laps	Estimated One-Mile Run Time[2]
10	13.00
11	12.75
12	12.48
13	12.23
14	12.03
15	11.83
16	11.65
17	11.47
18	11.32
19	11.17
20	11.05
21	10.92
22	10.80
23	10.67
24	10.57
25	10.45
26	10.35
27	10.25
28	10.15
29	10.05
30	9.97
31	9.87
32	9.77
33	9.70
34	9.62
35	9.52
36	9.45
37	9.37
38	9.30
39	9.22
40	9.15
41	9.07
42	9.00
43	8.92
44	8.85
45	8.77
46	8.70
47	8.65
48	8.57
49	8.50
50	8.44

20m PACER Laps	Estimated One-Mile Run Time[2]
51	8.37
52	8.32
53	8.24
54	8.19
55	8.12
56	8.07
57	7.99
58	7.94
59	7.87
60	7.82
61	7.77
62	7.69
63	7.64
64	7.59
65	7.54
66	7.49
67	7.42
68	7.37
69	7.32
70	7.27
71	7.22
72	7.17
73	7.12
74	7.07
75	7.02
76	6.97
77	6.92
78	6.87
79	6.82
80	6.77
81	6.72
82	6.67
83	6.62
84	6.59
85	6.54
86	6.49
87	6.44
88	6.42
89	6.37
90	6.32

[1] Zhu, W., Plowman, S.A., & Park, Y. (2010). A primer-test centered equating method for setting cut-off scores. *Research Quarterly for Exercise and Sport, 81*(4), 400–409.

[2] One-Mile Run time is reported in minutes. That is, minutes and seconds have been converted to minutes, with seconds/60 shown as a decimal part of a minute.

20m PACER Laps	Estimated One-Mile Run Time[2]
91	6.29
92	6.24
93	6.19
94	6.17
95	6.12
96	6.09
97	6.04
98	6.02
99	5.97
100	5.94
101	5.89
102	5.87
103	5.84
104	5.79
105	5.77
106	5.74
107	5.69
108	5.67
109	5.64
110	5.62
111	5.57
112	5.54
113	5.52
114	5.49
115	5.47
116	5.44
117	5.42
118	5.39
119	5.37
120	5.34
121	5.32
122	5.29
123	5.26
124	5.26
125	5.24
126	5.21
127	5.19
128	5.16
129	5.16
130	5.14
131	5.11
132	5.11
133	5.09
134	5.06
135	5.06
136	5.04
137	5.01
138	5.01
139	4.99
140	4.99

20m PACER Laps	Estimated One-Mile Run Time[2]
141	4.96
142	4.94
143	4.90
144	4.88
145	4.86
146	4.84
147	4.81
148	4.79
149	4.77
150	4.75
151	4.73
152	4.71
153	4.69
154	4.67
155	4.65
156	4.63
157	4.61
158	4.59
159	4.57
160	4.55
161	4.53
162	4.51
163	4.49
164	4.47
165	4.45
166	4.43
167	4.41
168	4.39
169	4.37
170	4.35
171	4.33
172	4.32
173	4.30
174	4.28
175	4.26
176	4.24
177	4.22
178	4.21
179	4.19
180	4.17
181	4.15
182	4.14
183	4.12
184	4.10
185	4.08
186	4.07
187	4.05
188	4.03
189	4.02
190	4.00

[2] One-Mile Run time is reported in minutes. That is, minutes and seconds have been converted to minutes, with seconds/60 shown as a decimal part of a minute.