



## Chapter 4

# Profiles, Test Selection Guides, Standards, and Fitness Zones

This chapter presents the following elements: health-related, criterion-referenced parameters; test selection guides; standards; and fitness zones for assessing physical fitness for the general population and for each of the populations with disability targeted by the Brockport Physical Fitness Test. The chapter includes a series of tables depicting standards and fitness zones.

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## Youngsters in the General Population

### Health-Related Concerns

Health-related needs and concerns of youngsters in the general population include avoiding high blood pressure, coronary heart disease, obesity, diabetes, and some forms of cancer; maintaining lower-back health; and maintaining functional health.

### Desired Profile

Boys and girls aged 10 to 17 years should possess, at minimum, levels of maximal oxygen uptake and body composition consistent with positive health, flexibility for functional health (especially good functioning of the lower back and hamstrings), and levels of abdominal and upper-body strength and endurance adequate for independent living and participation in physical activities.

### Components of Physical Fitness

The components of physical fitness are categorized as aerobic functioning, body composition, and musculoskeletal functioning. Test items to assess these components appear in table 4.1.

**Table 4.1** Test-Item Selection Guide for Youngsters in the General Population

Fitness component	Test item	Selection guide
Aerobic functioning	<b>SELECT ONE:</b>	
	1-mile run/walk (aerobic capacity)	R
	20 m PACER (aerobic capacity; strongly recommended for elementary and recommended for all ages)	R
	15 m PACER (aerobic capacity; strongly recommended for elementary)	R
	TAMT (aerobic behavior, level 1)	O
Body composition	<b>SELECT ONE:</b>	
	Percent body fat	R
	Skinfolds—sum of triceps and calf	R
	Body mass index	O
Musculoskeletal functioning	<b>SELECT TWO:</b>	
	Curl-up	R
	Trunk lift	R
	<b>SELECT ONE:</b>	
	90° push-up	R
	Modified pull-up	O
	Pull-up	O
	Flexed-arm hang	O
	<b>SELECT ONE:</b>	
	Back-saver sit-and-reach	R
	Shoulder stretch	O

Abbreviations: R = recommended; O = optional.

Data from The Cooper Institute 2013.

### Standards and Fitness Zones

Standards and Healthy Fitness Zones (HFZs) from Fitnessgram for the general population are presented in Fitness Zone tables 1 and 2.

**Aerobic Functioning**

For the general population, aerobic capacity (via the PACER or one-mile run/walk) is evaluated using the HFZs from Fitnessgram. The aerobic capacity standards establish three zones based on potential risk for future health problems. Aerobic behavior, on the other hand, is measured using the target aerobic movement test (TAMT). It is evaluated using the HFZ based on general standards developed as part of Project Target (1998).

**Body Composition**

For the general population, body composition is evaluated using the standards and HFZs from Fitnessgram. Percent body fat is estimated using skinfolds (or bioelectrical impedance analysis). Body mass index (BMI) data corresponding to percentage fat for boys and girls in each targeted age group also come from Fitnessgram. "Boys and girls have BMI values that are very different due to the dramatic changes in growth and development that occur with age. Therefore, age- and sex-specific values of BMI are used to assess weight status for youth" (Cooper Institute, 2013, p. 43). The body composition standards establish four zones based on potential risks for future health problems.

**Musculoskeletal Functioning**

General standards from Fitnessgram for muscular strength and endurance items are used to evaluate youngsters in the general population. Minimal muscular strength and endurance standards correspond closely to fitness levels equal to those for the 20th percentile of the general population. General standards from Fitnessgram associated with test items designed to assess flexibility (back-saver sit-and-reach and shoulder stretch) or trunk extension strength and flexibility (trunk lift) are based on normative data and expert judgment on what represents an acceptable level of function. For the trunk lift, scores beyond 12 inches (30 centimeters) are discouraged.

## ***Youngsters With Intellectual Disability and Mild Limitations in Physical Fitness***

**Health-Related Concerns**

Health-related needs and concerns of youngsters with intellectual disability and mild limitations in physical fitness include those of youngsters in the general population. Additional concerns relate to inability to sustain aerobic activity and musculoskeletal functioning within acceptable levels and incapacity for independent living and participation in daily living activities (including sport and movement activities).

**Desired Profile**

Boys and girls aged 10 to 17 years with intellectual disability and mild limitations in physical fitness should possess, at minimum, levels of aerobic behavior consistent with the ability to sustain moderate physical activity or progress toward a level of aerobic capacity consistent with positive health; body composition consistent with positive health; healthful levels of flexibility or range of motion (especially of the lower back); and levels of abdominal and upper-body strength and endurance appropriate for independent living, participation in physical activities, and progress toward performance levels of peers in the general population.

**Components of Physical Fitness**

Test items to assess aerobic functioning, body composition, and musculoskeletal functioning for this population appear in table 4.2.

**Table 4.2** Test-Item Selection Guide for Youngsters With Intellectual Disability and Mild Limitation in Physical Fitness

Fitness component	Test item	Selection guide
Aerobic functioning	<b>SELECT ONE:</b>	
	15 m PACER (aerobic capacity; ages 10–12) or 20 m PACER (aerobic capacity; ages 13–17)	R
	TAMT (aerobic behavior, level 1)	R
Body composition	<b>SELECT ONE:</b>	
	Percent body fat	R
	Skinfolds	
	Sum of triceps and calf	R
	Sum of triceps and subscapular	O
	Body mass index	O
Musculoskeletal functioning	<b>SELECT ONE:</b>	
	Dominant grip strength (ages 10–17)	O
	Isometric push-up (ages 10–12) or bench press (ages 13–17)	O
	<b>SELECT ONE:</b>	
	Extended-arm hang (ages 10–12)	R
	Flexed-arm hang (ages 13–17)	R
	<b>SELECT ONE:</b>	
	Back-saver sit-and-reach	R
	Shoulder stretch	O
	<b>REQUIRED:</b>	
	Modified curl-up	R
	Trunk lift	R

Abbreviations: R = recommended; O = optional.

## Standards and Fitness Zones

The physical fitness of youngsters with intellectual disability is evaluated using both general and specific standards. Youngsters attaining HFZs based on general standards related to body composition, aerobic behavior, and flexibility meet acceptable health-related levels of physical fitness for the general population. Youngsters meeting AFZ levels based on specific standards for test items attain target levels of physical fitness adjusted for the effects of impairment. AFZ levels represent attainable steps in progressing toward acceptable levels of health-related physical fitness for the general population. Standards and fitness zones for youngsters with intellectual disability and mild limitation in fitness can be found in Fitness Zone tables 3 and 4, located at the end of the chapter.

### Aerobic Functioning

Aerobic *capacity* in youngsters with intellectual disability is evaluated using AFZs and HFZs based on specific and general standards associated with the PACER. AFZs represent target levels of aerobic capacity adjusted for youngsters with intellectual disability. They reflect a 10 percent downward adjustment from the HFZ standards for  $\dot{V}O_2$  max recommended for youngsters in the general population. General standards and HFZs for  $\dot{V}O_2$  max represent levels of aerobic capacity consistent with minimizing potential risk for future health problems and with adequate functioning for daily living. Aerobic *behavior* is measured by the TAMT, in which performance for 15 minutes at level 1 is an HFZ based on a general standard representing ability to sustain moderate physical activity. The same standard exists for all levels of the test. Level 1 is the minimal test level recommended for youngsters with intellectual disability and mild limitations in physical fitness.

**Body Composition**

The HFZs based on general standards are recommended for evaluation of body composition of youngsters with intellectual disability and mild limitation in physical fitness. No adjustments are made for disability.

**Musculoskeletal Functioning**

HFZs and AFZs based on general and specific standards are used for evaluating dominant grip strength, extended-arm hang, isometric push-up, bench press, and flexed-arm hang for youngsters with intellectual disability and mild limitation in physical fitness. The AFZs reflect levels of strength or endurance adjusted for intellectual disability. Specific standards for youngsters with intellectual disability represent the following percentages of the performances of students in the general population: dominant grip strength, 65 percent; extended-arm hang, 75 percent; isometric push-up, bench press, flexed-arm hang, and modified curl-up, 50 percent.

Youngsters with intellectual disability can also be evaluated using general standards. For dominant grip, extended-arm hang, isometric push-up, and bench press, the general standards represent approximately the 20th percentile of performance by a Project Target sample of youth from the general population. General standards for flexed-arm hang and modified curl-up represent minimal standards for youth from the general population (Cooper Institute, 2013). It is recommended that HFZs based on general standards reflecting positive levels of physical fitness be used for evaluation of the back-saver sit-and-reach, trunk lift, and shoulder stretch.

## ***Youngsters With Visual Impairment***

**Health-Related Concerns**

Health-related needs and concerns of youngsters with visual impairment include those of students in the general population, as well as musculoskeletal functioning necessary for appropriate pelvic alignment and posture.

**Desired Profile**

Boys and girls aged 10 to 17 years should possess, at minimum, levels of maximal oxygen uptake and body composition consistent with positive health, flexibility for functional health (especially appropriate pelvic alignment and posture and functioning of the lower back), and levels of abdominal and upper-body strength and endurance adequate for independent living and participation in physical activities.

**Components of Physical Fitness**

Test items to assess aerobic functioning, body composition, and musculoskeletal functioning for this population appear in table 4.3.

**Standards and Fitness Zones**

Standards and fitness zones for youngsters with visual impairment (blindness) can be found in Fitness Zone tables 5 and 6, located at the end of the chapter.

**Table 4.3** Test-Item Selection Guide for Youngsters With Visual Impairment

Fitness component	Test item	Selection guide
Aerobic functioning	<b>SELECT ONE:</b>	
	PACER: 15 m or 20 m (aerobic capacity; ages 10–17)	R
	1-mile run/walk (aerobic capacity; ages 15–17)	O
	TAMT (aerobic behavior, level 1)	O
Body composition	<b>SELECT ONE:</b>	
	Percent body fat	R
	Skinfolds—sum of triceps and calf	R
	Body mass index	O
Musculoskeletal functioning	<b>Required:</b>	
	Curl-up	R
	Trunk lift	R
	<b>SELECT ONE:</b>	
	Push-up	R
	Pull-up	O
	Modified pull-up	O
	Flexed-arm hang	O
	<b>SELECT ONE:</b>	
	Back-saver sit-and-reach	R
	Shoulder stretch	O

Abbreviations: R = recommended; O = optional.

### Aerobic Functioning

The HFZ standards used for evaluating aerobic functioning (aerobic capacity and aerobic behavior) for the general population can be used for youngsters with visual impairment. Specific standards are also available; those associated with the AFZ are recommended for youngsters who are blind and require assistance in performing the one-mile run/walk and the PACER. These specific standards are based on a 3 percent reduction of  $\dot{V}O_2$ max standards associated with the general population. Remember, however, that most youngsters with visual impairment can be evaluated using the general standards that are used for their sighted peers.

### Body Composition

The HFZs based on general standards for percentage body fat and BMI are recommended for youngsters with visual impairment. No adjustments are made for disability.

### Musculoskeletal Functioning

It is recommended that youngsters with visual impairment be evaluated using HFZ levels based on general standards.



## Youngsters With Spinal Cord Injury

### Health-Related Concerns

Health-related needs and concerns typical of youngsters with spinal cord injury include those of students in the general population. Additional concerns include inability to sustain aerobic activity; lack of flexibility or range of motion in the hips and upper body, particularly the shoulder; lack of strength and endurance to lift and transfer the body independently, lift the body to prevent decubitus ulcers, and propel a wheelchair; and excessive body fat, which inhibits health.

### Desired Profile

Individuals with spinal cord injury should possess, at minimum, the ability to sustain moderate physical activity, body composition consistent with positive health, levels of flexibility and range of motion to perform activities of daily living and to inhibit contractures, levels of muscular strength and endurance for wheelchair users to lift and transfer the body and push a wheelchair, muscular strength and endurance to counteract muscular weaknesses, and fitness levels needed to enhance the performance of daily living activities (including sport activities).

### Components of Physical Fitness

Test items to assess aerobic functioning, body composition, and musculoskeletal functioning in this population appear in table 4.4.

**Table 4.4** Test-Item Selection Guide for Youngsters With Spinal Cord Injury

Fitness component	Test item	Selection guide		
		LLQ Low-level (C6–C8) quadriplegic	SCI-PW Paralegic- wheelchair	SCI-PA Paralegic- ambulatory
Aerobic functioning	TAMT (aerobic behavior, level 1)	R	R	R
Body composition	<b>SELECT ONE:</b>			
	Percent body fat	R	R	R
	Skinfolds			
	Sum of triceps and subscapular	R	R	R
	Triceps only	O	O	O
Musculoskeletal functioning	<b>REQUIRED (IF APPROPRIATE):</b>			
	Seated push-up	O/TA <sup>a</sup>	R	
	<b>SELECT ONE:</b>			
	Reverse curl	R		
	Dominant grip strength		R	R
	Bench press (ages 13–17) or dumbbell press (dominant; ages 13–17)		O	O
	<b>RECOMMENDED:</b>			
	Modified Apley test		R	R
	Modified Thomas test			R
	TST <sup>b</sup>	R	R <sup>c</sup>	

Abbreviations: R = recommended; O = optional; TA = task analysis.

<sup>a</sup> Task analysis of test items for muscular strength and endurance or variations of test items that reflect the needs and abilities of the individual.

<sup>b</sup> Select at least two items from the TST on the basis of possible participant needs. For LLQ, shoulder abduction, shoulder external rotation, and forearm pronation are recommended. For SCI-PA, shoulder abduction and shoulder external rotation are recommended if the modified Apley test is not passed. Measure both extremities on the modified Apley, modified Thomas, and TST, and apply health-related standards as appropriate.

<sup>c</sup> Recommended if the modified Apley test is not passed with a score of 3.

## **Standards and Fitness Zones**

Standards and fitness zones recommended for the evaluation of youngsters with spinal cord injury appear in Fitness Zone tables 7 and 8, located at the end of the chapter.

### **Aerobic Functioning**

For youngsters with spinal cord injury, aerobic behavior is measured using the TAMT. Completion of level 1 of the test for 15 minutes represents ability to sustain moderate physical activity and is the recommended HFZ for the test.

### **Body Composition**

The HFZs based on general standards associated with percentage body fat are recommended for evaluating body composition; no adjustments are made for disability. The BMI test item is not recommended for youngsters with spinal cord injury.

### **Musculoskeletal Functioning**

Musculoskeletal functioning is evaluated using a variety of standards in this population. General standards for HFZs for dominant grip strength, bench press, and dumbbell press are based on 20th percentile values of a sample of youngsters from the general population. The 5-second specific AFZ standard for the seated push-up is related to the recommendation that wheelchair users should relieve skin pressure on their buttocks and legs for at least 5 seconds every 15 minutes. The 20-second standard is a higher level of strength and endurance that enhances lifting and transferring of the body, as well as wheelchair propulsion.

The AFZ based on the specific standard for the reverse curl is tied directly to the functional ability to lift a 1-pound (0.5-kilogram) weight one time. The HFZs based on general standards for the modified Apley and Thomas tests (a score of 3) indicate, respectively, that youngsters have optimal flexibility of the shoulder joint and optimal hip extension. A score of 1 on target stretch test (TST) items indicates a functional range of motion in a joint associated with the AFZ. A score of 2 is the HFZ, reflecting optimal flexibility in a joint.



## Youngsters With Cerebral Palsy

### Health-Related Concerns

Health-related needs and concerns of youngsters with cerebral palsy include those typical for students in the general population. Additional concerns include inability to sustain aerobic activity; lack of flexibility or range of motion in various joints of the body; insufficient muscular strength and endurance to maintain muscular balance and body symmetry; inability to engage in independent mobility, lift and transfer the body, perform activities of daily living, and participate in leisure activities; and either excessive or insufficient body fat, which inhibits health.

### Desired Profile

Individuals with cerebral palsy should possess, at minimum, the ability to sustain moderate physical activity; body composition consistent with positive health; and levels of flexibility and muscular strength and endurance to foster independent living (including mobility), muscle balance and body symmetry, and participation in a variety of physical activities (including sport or leisure activities).

### Components of Physical Fitness

Test items to assess aerobic functioning, body composition, and musculoskeletal functioning in this population appear in table 4.5.

### Standards and Fitness Zones

Standards recommended for evaluation pertain only to test items designated as recommended or optional for youngsters with cerebral palsy. Musculoskeletal functioning standards may be associated with specific classifications. Youngsters with cerebral palsy are required to attain standards on only one side of the body (i.e., dominant or preferred side) for the following items: modified Apley test, TST, dumbbell press, and dominant grip strength. Standards and fitness zones for youngsters with cerebral palsy can be found in Fitness Zone tables 9 and 10, located at the end of the chapter.

### Aerobic Functioning

For youngsters with cerebral palsy, aerobic behavior is measured using the TAMT. Completion of level 1 of the test for 15 minutes represents the ability to sustain moderate physical activity and is the recommended HFZ based on a general standard.

### Body Composition

An HFZ based on general standards for percentage body fat is recommended for youngsters with cerebral palsy; no adjustment is made for disability. HFZs represent optimal levels of body fat. Skinfold measures and body mass index relate to these body fat ranges; BMI should be used only if height and weight can be measured accurately.

### Musculoskeletal Functioning

Musculoskeletal functioning is evaluated using a variety of standards. HFZs based on general standards for dominant grip and dumbbell press are based on 20th percentile values of a sample of youngsters from the general population. The standard for the 40-meter push/walk is suggested for functional mobility, which reflects a level of musculoskeletal ability involving strength, endurance, and flexibility. The 5-second specific standard for the seated push-up is related to the recommendation that wheelchair users should relieve the skin pressure on their buttocks and legs for at least 5 seconds every 15 minutes. The 20-second specific standard represents a higher level of strength and endurance, which enhances muscular balance around the elbow, ability to transfer the body, and ability to propel a wheelchair.

The 8-foot (2.4-meter) specific standard for the wheelchair ramp test reflects the ability to ascend a ramp with approximately one step of elevation (8 inches or 20 centimeters), such as would be found at a corner curb cut. The 15-foot (4.6-meter) specific standard in the AFZ can vary (at the discretion of the tester) as a function of the length of a ramp that a specific young person might frequently encounter in his or her environment.

**Table 4.5** Test-Item Selection Guide for Youngsters With Cerebral Palsy

Fitness component	Test item	Selection guide									
		CPISRA sport classifications									
		Motorized wheelchair	Wheelchair					Ambulatory			
			C1 <sup>a</sup>	C2U <sup>b</sup>	C2L <sup>b</sup>	C3	C4	C5	C6	C7	C8
Aerobic functioning	TAMT (aerobic behavior, level 1)	R	R	R	R	R	R	R	R	R	
Body composition	SELECT ONE:										
	Percent body fat	R	R	R	R	R	R	R	R	R	
	Skinfolds										
	Sum of triceps and subscapular	R	R	R	R	R	R	R	R	R	
	Triceps only	O	O	O	O	O	O	O	O	O	
	Body mass index	O	O	O	O	O	O	O	O	O	
Musculoskeletal functioning	SELECT ONE OR MORE:										
	Modified Apley test <sup>c,d</sup>	R	R		R	R	R	R	R	R	
	Modified Thomas test <sup>c</sup>						R	R	R	R	
	TST <sup>e</sup>	R	R	R	R	R	O	O	O	O	
	SELECT ONE OR MORE (EXCEPT FOR C1): <sup>a</sup>										
	Seated push-up <sup>f</sup>		R		R	R		R			
	40 m wheelchair push		R	R	O						
	40 m walk							R			
	Dominant grip strength					O	O		O	O	
	Dumbbell press (dominant; ages 13–17)				O	O	O		R	R	
	Wheelchair ramp test				R						

Abbreviations: R = recommended; O = optional.

<sup>a</sup> If recommended test items are inappropriate for individuals classified as C1, it is recommended that these test items or alternatives important to the individual be task-analyzed and used in connection with individual developmental progress.

<sup>b</sup> C2 participants with a higher degree of functioning in the upper extremities are classified 2U, and those with a higher degree of functioning in the lower extremities are classified as 2L.

<sup>c</sup> Test one or both extremities, as possible.

<sup>d</sup> Omit this item for C1 subjects using assistive devices.

<sup>e</sup> Test items should be administered on right and left extremities, as appropriate. TST items particularly important for people with cerebral palsy include elbow and shoulder extension, shoulder abduction, shoulder external rotation, and forearm supination. For ambulatory people, knee extension measurements may be particularly important.

<sup>f</sup> Test item is not recommended for hemiplegic C3 and C4 participants. Hemiplegic participants should be given the dumbbell press.

Standards for the modified Apley test, modified Thomas test, and TST vary for each classification. Modified Apley test standards are derived on a logical basis (see chapter 2 for description). The general standard for HFZ for the modified Apley test (a score of 3) is recommended for youngsters in classes C2U to C8. An AFZ based on a specific standard of 2 is recommended for classes C1 and C2L. Modified Thomas test standards relate to flexibility of the hip flexors. An AFZ based on a general standard for the modified Thomas test (a score of 3) is recommended for youngsters in classes C6 and C8. An AFZ based on a specific standard of 2 is recommended for class C5. For class C7 (hemiplegia), a score of 3 is recommended for the unaffected side of the body, and a score of 2 is recommended for the affected side. The TST standard for youngsters in most classes (C3 through C8) is a score of 1, which represents a clinically accepted functional range of motion in a joint. An HFZ based on a general standard (a score of 2) represents optimal range of motion for a particular joint. The TST is also

recommended for classes C1 and C2; however, individualized standards are recommended for these classes. Standards for the TST and modified Apley test for youngsters with cerebral palsy are applied to the dominant or preferred side of the body.

## ***Youngsters With Congenital Anomaly or Amputation***

### **Health-Related Concerns**

Health-related needs and concerns of youngsters with congenital anomaly or amputation include those typical of students in the general population. Additional concerns include inability to sustain aerobic activity; lack of upper- and lower-body flexibility or range of motion; lack of muscular strength and endurance of wheelchair users to lift and transfer the body independently; inability to overcome architectural barriers, lift the body to prevent decubitus ulcers, and propel a wheelchair; and excessive body fat, which inhibits health.

### **Desired Profile**

Individuals with congenital anomaly or amputation should possess, at minimum and as appropriate, the ability to sustain moderate physical activity or physical activity that promotes levels of functioning consistent with positive health; body composition consistent with positive health; levels of flexibility and range of motion to perform activities of daily living and inhibit contractures; levels of muscular strength and endurance in wheelchair users to lift and transfer the body, overcome architectural barriers, and propel a wheelchair; abdominal and upper-body muscular strength and endurance to counteract muscular weakness; and fitness levels needed to enhance performance of daily living activities (including sport and movement activities).

### **Components of Physical Fitness**

Test items to assess aerobic functioning, body composition, and musculoskeletal functioning in this population appear in table 4.6.

**Table 4.6** Test-Item Selection Guide for Youngsters With Congenital Anomaly or Amputation

Fitness component	Test item	Selection guide					
		Subclassification					
		One arm only	Two arms only	One leg only	Two legs only	One arm, one leg (same side)	One arm, one leg (opposite side)
Aerobic functioning	<b>SELECT ONE:</b>						
	PACER: 15 m, 20 m (ages 10–17; aerobic capacity)	R	R				
	1-mile run/walk (aerobic capacity)	O	O				
	TAMT (aerobic behavior, level 1)			R	R	R	R
Body composition	<b>SELECT ONE:</b>						
	Percent body fat	R	R	R	R	R	R
	Skinfolds						
	Triceps only	R	R <sup>a</sup>	R	R	R	R
	Sum of triceps and subscapular	O	O <sup>a</sup>	R	R	R	R
	Sum of triceps and calf	R	O <sup>a</sup>	O		O	O
Musculoskeletal functioning	<b>SELECT ONE (UNAFFECTED LIMB[S]):</b>						
	Shoulder stretch or modified Apley test	R		R	R	R	R
	Back-saver sit-and-reach	R		R		R	
	<b>SELECT AS NEEDED (AFFECTED LIMBS); TST<sup>B</sup>:</b>						
	Knee extension			O <sup>c,d,e</sup>	O <sup>c,d,e</sup>	O <sup>c,d,e</sup>	O <sup>c,d,e</sup>
	Shoulder flexion	O <sup>d,e</sup>	O <sup>d,e</sup>			O <sup>d,e</sup>	O <sup>d,e</sup>
	External shoulder rotation	O <sup>d,e</sup>	O <sup>d,e</sup>			O <sup>d,e</sup>	O <sup>d,e</sup>
	Elbow extension	O <sup>d,e</sup>	O <sup>d,e</sup>			R <sup>d,e</sup>	R <sup>d,e</sup>
	<b>REQUIRED:</b>						
	Trunk lift	R	R				
	Curl-up	R	R				
	<b>SELECT ONE:</b>						
	Dumbbell press (dominant; ages 13–17)	R		O	O	R	R
	Bench press (ages 13–17)			R	R		
	Seated push-up			R <sup>f</sup>	R <sup>f</sup>		
	Dominant grip strength	O		O	O	O	O

<sup>a</sup> Selection depends on site of anomaly or amputation.<sup>b</sup> If additional unique range-of-motion needs are suspected, relevant joints may be tested using the TST.<sup>c</sup> Optional for below-knee amputation or anomaly of affected limbs only.<sup>d</sup> Optional in cases where measurement is possible and appropriate.<sup>e</sup> If potential is not limited by impairment, target scores of 1 or above on the TST are attainable. If impairment affects extent of movement, the TST may be used to obtain scores from which to determine individual status and progress.<sup>f</sup> Recommended only for wheelchair users.

## **Standards and Fitness Zones**

Standards and fitness zones recommended for evaluation of youngsters with congenital anomaly or amputation can be found in Fitness Zone tables 11 and 12, located at the end of the chapter.

### **Aerobic Functioning**

Aerobic behavior is measured using the TAMT. Completion of level 1 of the test for 15 minutes represents ability to sustain moderate physical activity and is the recommended general standard for the test. General standards for aerobic capacity (via the PACER and one-mile run/walk) are also provided, but test users are cautioned that results will likely be affected by loss of limb or function (especially for the one-mile run/walk).

### **Body Composition**

HFZ levels based on general standards are used for skinfolds tied to percentage body fat; no adjustment is made for disability. BMI is not recommended for youngsters with congenital anomaly or amputation.

### **Musculoskeletal Functioning**

Musculoskeletal functioning is evaluated using a variety of standards. HFZs based on general standards for dominant grip strength, dumbbell press, and bench press are based on 20th percentile values of the Project Target (1998) sample of youth from the general population. HFZ levels based on general standards for the curl-up *and* trunk lift correspond to values associated with Fitnessgram standards for youth in the general population (Cooper Institute, 2013). For subclassifications of people for whom the shoulder stretch, back-saver sit-and-reach, and modified Apley test are recommended for unaffected limbs, general standards are recommended for evaluation. Standards for these items reflect acceptable levels of flexibility. As indicated in table 4.6, selected items on the TST are recommended for various subclassifications. If potential is not limited by an impairment, a target score of 1 or above should be attainable. If an impairment affects extent of movement, the TST may be used to obtain scores for use in determining an individual's present status and progress. A score of 1 is the specific standard associated with an AFZ reflecting functional range of motion, and a score of 2 is the general standard associated with an HFZ reflecting optimal range of motion.

## **Fitness Zone Tables** **for Recommended and Optional Test Items**



This section provides the fitness zones that can be used with various populations of youngsters with disabilities. Fitness Zone tables 3 through 12 are available for printing from the web resource at [www.HumanKinetics.com/BrockportPhysicalFitnessTestManual](http://www.HumanKinetics.com/BrockportPhysicalFitnessTestManual) by using the pass code Brockport58743AR7.

**Fitness Zone Table 1** Boys' Fitnessgram Standards for Healthy Fitness Zone

Age (yr.)	Aerobic capacity $\dot{V}O_2$ MAX (ml/kg/min.)			Percent body fat				Body mass index			
	PACER, 1-mile run, and walk test										
	NI-Health risk*	NI	HFZ	Very lean	HFZ	NI	NI—health risk	Very lean	HFZ	NI	NI—health risk
5	Completion of test. Lap count or time standards not recommended.			≤8.8	8.9–18.8	18.9	≥27.0	≤13.8	13.9–16.8	16.9	≥18.1
6				≤8.4	8.5–18.8	18.9	≥27.0	≤13.7	13.8–17.1	17.2	≥18.8
7				≤8.2	8.3–18.8	18.9	≥27.0	≤13.7	13.8–17.6	17.7	≥19.6
8				≤8.3	8.4–18.8	18.9	≥27.0	≤13.9	14.0–18.2	18.3	≥20.6
9				≤8.6	8.7–20.6	20.7	≥30.1	≤14.1	14.2–18.9	19.0	≥21.6
10	≤37.3	37.4–40.1	≥40.2	≤8.8	8.9–22.4	22.5	≥33.2	≤14.4	14.5–19.7	19.8	≥22.7
11	≤37.3	37.4–40.1	≥40.2	≤8.7	8.8–23.6	23.7	≥35.4	≤14.8	14.9–20.5	20.6	≥23.7
12	≤37.6	37.7–40.2	≥40.3	≤8.3	8.4–23.6	23.7	≥35.9	≤15.2	15.3–21.3	21.4	≥24.7
13	≤38.6	38.7–41.0	≥41.1	≤7.7	7.8–22.8	22.9	≥35.0	≤15.7	15.8–22.2	22.3	≥25.6
14	≤39.6	39.7–42.4	≥42.5	≤7.0	7.1–21.3	21.4	≥33.2	≤16.3	16.4–23.0	23.1	≥26.5
15	≤40.6	40.7–43.5	≥43.6	≤6.5	6.6–20.1	20.2	≥31.5	≤16.8	16.9–23.7	23.8	≥27.2
16	≤41.0	41.1–44.0	≥44.1	≤6.4	6.5–20.1	20.2	≥31.6	≤17.4	17.5–24.5	24.6	≥27.9
17	≤41.2	41.3–44.1	≥44.2	≤6.6	6.7–20.9	21.0	≥33.0	≤18.0	18.1–24.9	25.0	≥28.6
>17	≤41.2	41.3–44.2	≥44.3	≤6.9	7.0–22.2	22.3	≥35.1	≤18.5	18.6–24.9	25.0	≥29.3

Age (yr.)	Curl-up (no. completed)	Trunk lift (in.)	90° push-up (no. completed)	Modified pull-up (no. completed)	Flexed-arm hang (sec.)	Back-saver sit-and-reach† (in.)	Shoulder stretch
5	≥2	6–12	≥3	≥2	≥2	8	Healthy Fitness Zone = touching fingertips together behind the back on both the right and left sides.
6	≥2	6–12	≥3	≥2	≥2	8	
7	≥4	6–12	≥4	≥3	≥3	8	
8	≥6	6–12	≥5	≥4	≥3	8	
9	≥9	6–12	≥6	≥5	≥4	8	
10	≥12	9–12	≥7	≥5	≥4	8	
11	≥15	9–12	≥8	≥6	≥6	8	
12	≥18	9–12	≥10	≥7	≥10	8	
13	≥21	9–12	≥12	≥8	≥12	8	
14	≥24	9–12	≥14	≥9	≥15	8	
15	≥24	9–12	≥16	≥10	≥15	8	
16	≥24	9–12	≥18	≥12	≥15	8	
17	≥24	9–12	≥18	≥14	≥15	8	
>17	≥24	9–12	≥18	≥14	≥15	8	

Age	PACER (20m laps)		
	NI HR <sup>a</sup>	NI <sup>a</sup>	HFZ <sup>b</sup>
5–9	Completion of test. Lap count or time standards not recommended.		
10	8	9–16	≥17
11	11	12–19	≥20
12	15	16–22	≥23
13	21	22–28	≥29
14	27	28–35	≥36
15	33	34–41	≥42
16	37	38–46	≥47
17	41	42–49	≥50

\*NI = Needs improvement.

†Test is scored yes/no; must reach this distance on each side to achieve the HFZ.

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<sup>a</sup>NI HR and NI lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013).

<sup>b</sup>Reprinted, by permission, from The Cooper Institute, 2014, *Goal setting chart for aerobic capacity and PACER test*.



**Fitness Zone Table 2** Girls' Fitnessgram Standards for Healthy Fitness Zone

Age (yr.)	Aerobic capacity $\dot{V}O_2$ MAX (ml/kg/min.)			Percent body fat				Body mass index			
	PACER, 1-mile run, and walk test										
	NI-Health risk*	NI	HFZ	Very lean	HFZ	NI	NI— health risk	Very lean	HFZ	NI	NI— health risk
5	Completion of test. Lap count or time standards not recommended.			≤9.7	9.8–20.8	20.9	≥28.4	≤13.5	13.6–16.8	16.9	≥18.5
6				≤9.8	9.9–20.8	20.9	≥28.4	≤13.4	13.5–17.0	17.3	≥19.2
7				≤10.0	10.1–20.8	20.9	≥28.4	≤13.5	13.5–17.5	18.0	≥20.2
8				≤10.4	20.5–20.8	20.9	≥28.4	≤13.6	13.6–18.2	18.7	≥21.2
9				≤10.9	11.0–22.6	22.7	≥30.8	≤13.9	13.8–18.9	19.5	≥22.4
10	≤37.3	37.4–40.1	≥40.2	≤11.5	11.6–24.3	24.4	≥33.0	≤14.2	14.3–20.3	20.4	≥23.6
11	≤37.3	37.4–40.1	≥40.2	≤12.1	12.2–25.7	25.8	≥34.5	≤14.6	14.7–21.2	21.3	≥24.7
12	≤37.0	37.1–40.0	≥40.1	≤12.6	12.7–26.7	26.8	≥35.5	≤15.1	15.2–22.1	22.2	≥25.8
13	≤36.6	68.7–39.6	≥39.7	≤13.3	13.4–27.7	27.8	≥36.3	≤15.6	15.7–22.9	23.0	≥26.8
14	≤36.3	36.4–39.3	≥39.4	≤13.9	14.0–28.5	28.6	≥36.8	≤16.1	16.2–23.6	23.7	≥27.7
15	36.0	36.1–39.0	≥39.1	≤14.5	14.6–29.1	29.2	≥37.1	≤16.6	16.7–24.3	24.4	≥28.5
16	≤35.8	35.9–38.8	≥38.9	≤15.2	15.3–29.7	29.8	≥37.4	≤17.0	17.1–24.8	24.9	≥29.3
17	≤35.7	35.8–38.7	≥38.8	≤15.8	15.9–30.4	20.5	≥37.9	≤17.4	17.5–24.9	25.0	≥30.0
>17	≤35.3	35.4–38.5	≥38.6	≤16.4	16.5–31.3	31.4	≥38.6	≤17.7	17.8–24.9	25.0	≥30.0

Age (yr.)	Curl-up (no. completed)	Trunk lift (in.)	90° push-up (no. completed)	Modified pull-up (no. completed)	Flexed-arm hang (sec.)	Back-saver sit-and-reach† (in.)	Shoulder stretch
5	≥2	6–12	≥3	≥2	≥2	9	Healthy Fitness Zone = touching fingertips together behind the back on both the right and left sides.
6	≥2	6–12	≥3	≥2	≥2	9	
7	≥4	6–12	≥4	≥3	≥3	9	
8	≥6	6–12	≥5	≥4	≥3	9	
9	≥9	6–12	≥6	≥4	≥4	9	
10	≥12	9–12	≥7	≥4	≥4	9	
11	≥15	9–12	≥7	≥4	≥6	10	
12	≥18	9–12	≥7	≥4	≥7	10	
13	≥18	9–12	≥7	≥4	≥8	10	
14	≥18	9–12	≥7	≥4	≥8	10	
15	≥18	9–12	≥7	≥4	≥8	12	
16	≥18	9–12	≥7	≥4	≥8	12	
17	≥18	9–12	≥7	≥4	≥8	12	
>17	≥18	9–12	≥7	≥4	≥8	12	

Age	PACER (20m laps)		
	NI HR <sup>a</sup>	NI <sup>a</sup>	HFZ <sup>b</sup>
5–9	Completion of test. Lap count or time standards not recommended.		
10	8	9–16	≥17
11	11	12–19	≥20
12	13	14–22	≥23
13	15	16–24	≥25
14	17	18–26	≥27
15	20	21–29	≥30
16	22	23–31	≥32
17	25	26–34	≥35

\*NI = Needs improvement.

†Test is scored yes/no; must reach this distance on each side to achieve the HFZ.

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<sup>a</sup>NI HR and NI lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013).

<sup>b</sup>Reprinted, by permission, from The Cooper Institute, 2014, *Goal setting chart for aerobic capacity and PACER test*.

**Fitness Zone Table 3 Boys With Intellectual Disability**

Age (yr.)	PACER (20 m laps)		TAMT (pass/fail)		Percent body fat <sup>c</sup>			Triceps and calf skinfold <sup>e</sup> (mm)	Body mass index <sup>c</sup>		
	NI <sup>a</sup>	AFZ <sup>a</sup>	HFZ <sup>b</sup>	NI	HFZ <sup>d</sup>	Very lean	HFZ	NI	(health risk)	Very lean	HFZ
10	≤4	5–16	≥17	F	P	≤8.8	8.9–22.4	22.5	≥33.2	≤14.4	14.5–19.7
11	≤7	8–19	≥20	F	P	≤8.7	8.8–23.6	23.7	≥35.4	≤14.8	14.9–20.5
12	≤11	12–22	≥23	F	P	≤8.3	8.4–23.6	23.7	≥35.9	≤15.2	15.3–21.3
13	≤16	17–28	≥29	F	P	≤7.7	7.8–22.8	22.9	≥35.0	≤15.7	15.8–22.2
14	≤23	24–35	≥36	F	P	≤7.0	7.1–21.3	21.4	≥33.2	≤16.3	16.4–23.0
15	≤29	30–41	≥42	F	P	≤6.5	6.6–20.1	20.2	≥31.5	≤16.8	16.9–23.7
16	≤33	34–46	≥47	F	P	≤6.4	6.5–20.1	20.2	≥31.6	≤17.4	17.5–24.5
17	≤37	38–49	≥50	F	P	≤6.6	6.7–20.9	21.0	≥33.0	≤18.0	18.1–24.9

Age (yr.)	Isometric push-up (sec.)		Bench press (# completed)		Extended-arm hang (sec.)		Flexed-arm hang (sec.)		Grip strength (kg)		Modified curl-up (# completed)	
	NI	AFZ	HFZ <sup>d</sup>	NI	AFZ	HFZ <sup>d</sup>	NI	AFZ	HFZ <sup>c</sup>	NI	AFZ	HFZ <sup>c</sup>
10	≤19	20–39	40				≤22	23–29	30–40	≤11	12–17	≥18
11	≤19	20–39	40				≤22	23–29	30–40	≤13	14–20	≥21
12	≤19	20–39	40				≤22	23–29	30–40	≤15	16–24	≥25
13				≤9	10–19	20–50				≤18	19–28	≥29
14				≤15	16–32	33–50				≤21	22–32	≥33
15				≤19	20–39	40–50				≤23	24–36	≥37
16				≤22	23–46	47–50				≤27	28–42	≥43
17				≤24	25–49	50				≤31	32–48	≥49

Age (yr.)	Trunk lift (in.)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)	
	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>
10	≤8	9–12	F	P	≤7	8
11	≤8	9–12	F	P	≤7	8
12	≤8	9–12	F	P	≤7	8
13	≤8	9–12	F	P	≤7	8
14	≤8	9–12	F	P	≤7	8
15	≤8	9–12	F	P	≤7	8
16	≤8	9–12	F	P	≤7	8
17	≤8	9–12	F	P	≤7	8

- NI and AFZ lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013). AFZ lap range represents a 10 percent reduction from  $\dot{V}O_{2\max}$  standard for the general population. Where appropriate, youngsters with intellectual disability should pursue standards for the HFZ.
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- Based on Project Target (1998).
- The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65, 101.

**Fitness Zone Table 4** Girls With Intellectual Disability

Age (yr.)	PACER (20 m laps)		TAMT (pass/fail)		Percent body fat <sup>c</sup>			Triceps and calf skinfold <sup>e</sup> (mm)		Body mass index <sup>c</sup>		
	NI <sup>a</sup>	AFZ <sup>a</sup>	HFZ <sup>b</sup>	NI	HFZ <sup>d</sup>	Very lean	HFZ	NI	(health risk)	Very lean	HFZ	NI
10	≤4	5–16	≥17	F	P	≤11.5	11.6–24.3	24.4	≥33.0	≤14.2	14.3–20.3	20.4
11	≤7	8–19	≥20	F	P	≤12.1	12.2–25.7	25.8	≥34.5	≤14.6	14.7–21.2	21.3
12	≤10	11–22	≥23	F	P	≤12.6	12.7–26.7	26.8	≥35.5	≤15.1	15.2–22.1	22.2
13	≤12	13–24	≥25	F	P	≤13.3	13.4–27.7	27.8	≥36.3	≤15.6	15.7–22.9	23.0
14	≤15	16–26	≥27	F	P	≤13.9	14.0–28.5	28.6	≥36.8	≤16.1	16.2–23.6	23.7
15	≤17	18–29	≥30	F	P	≤14.5	14.6–29.1	29.2	≥37.1	≤16.6	16.7–24.3	24.4
16	≤20	21–31	≥32	F	P	≤15.2	15.3–29.7	29.8	≥37.4	≤17.0	17.1–24.8	24.9
17	≤23	24–34	≥35	F	P	≤15.8	15.9–30.4	30.5	≥37.9	≤17.4	17.5–24.9	25.0

Age (yr.)	Isometric push-up (sec.)		Bench press (# completed)		Extended-arm hang (sec.)		Flexed-arm hang (sec.)		Grip strength (kg)		Modified curl-up (# completed)	
	NI	AFZ	HFZ <sup>d</sup>	NI	AFZ	HFZ <sup>d</sup>	NI	AFZ	NI	AFZ	NI	AFZ
10	≤12	13–24	25–40		≤14	15–19	20–40		≤10	11–16	≤6	7–11
11	≤12	13–24	25–40		≤14	15–19	20–40		≤11	12–18	≤8	9–14
12	≤12	13–24	25–40		≤14	15–19	20–40		≤13	14–21	≤10	11–17
13			≤4	5–9	10–50			≤3	4–7	16–23	≤10	11–17
14			≤5	6–12	13–50			≤3	4–7	17–25	≤10	11–17
15			≤6	7–13	14–50			≤3	4–7	19–28	≤10	11–17
16			≤6	7–13	14–50			≤3	4–7	19–28	≤10	11–17
17			≤7	8–14	15–50			≤3	4–7	19–28	≤10	11–17

Age (yr.)	Trunk lift (in.)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)	
	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>
10	≤8	9–12	F	P	≤8	9
11	≤8	9–12	F	P	≤9	10
12	≤8	9–12	F	P	≤9	10
13	≤8	9–12	F	P	≤9	10
14	≤8	9–12	F	P	≤9	10
15	≤8	9–12	F	P	≤11	12
16	≤8	9–12	F	P	≤11	12
17	≤8	9–12	F	P	≤11	12

- NI and AFZ lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013). AFZ lap range represents a 10 percent reduction from VO<sub>2</sub>max standard for the general population. Where appropriate, youngsters with intellectual disability should pursue standards for the HFZ.
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- Based on data from Project Target (1998).
- The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66, 102.

**Fitness Zone Table 5 Boys With Visual Impairment (Blindness)**

Age (yr.)	PACER (20 m laps)		1-mile run (VO <sub>2</sub> MAX)		TAMT (pass/fail)		Percent body fat <sup>c</sup>			Triceps and calf skinfold <sup>f</sup> (mm)	
	NI <sup>a</sup>	AFZ <sup>a</sup>	HFZ <sup>b</sup>	NI	AFZ <sup>a</sup>	HFZ <sup>c</sup>	NI	HFZ <sup>d</sup>	Very lean	HFZ	NI (health risk)
10	≤12	13–16	≥17	≤38.9	39.0–40.1	≥40.2	F	P	≤8.8	8.9–22.4	≥33.2
11	≤15	16–19	≥20	≤38.9	39.0–40.1	≥40.2	F	P	≤8.7	8.8–23.6	≥35.4
12	≤19	20–22	≥23	≤39.0	39.1–40.2	≥40.3	F	P	≤8.3	8.4–23.6	≥35.9
13	≤24	25–28	≥29	≤39.8	39.9–41.0	≥41.1	F	P	≤7.7	7.8–22.8	≥35.0
14	≤31	32–35	≥36	≤41.1	41.2–42.4	≥42.5	F	P	≤7.0	7.1–21.3	≥33.2
15	≤37	38–41	≥42	≤42.2	42.3–43.5	≥43.6	F	P	≤6.5	6.6–20.1	≥31.5
16	≤42	43–46	≥47	≤42.7	42.8–44.0	≥44.1	F	P	≤6.4	6.5–20.1	≥31.6
17	≤45	46–49	≥50	≤42.8	42.9–44.1	≥44.2	F	P	≤6.6	6.7–20.9	≥33.0

Age (yr.)	Body mass index <sup>c</sup>			Flexed-arm hang (sec.)		Push-up (# completed)		Pull-up (# completed)		Modified pull-up (# completed)		Curl-up (# completed)	
	Very lean	HFZ	NI (health risk)	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>
10	≤14.4	14.5–19.7	19.8	≥22.7	≥4	≤6	≥7	0	≥1	≤4	≥5	≤11	≥12
11	≤14.8	14.9–20.5	20.6	≥23.7	≥6	≤7	≥8	0	≥1	≤5	≥6	≤14	≥15
12	≤15.2	15.3–21.3	21.4	≥24.7	≥10	≤9	≥10	0	≥1	≤6	≥7	≤17	≥18
13	≤15.7	15.8–22.2	22.3	≥25.6	≥12	≤11	≥12	0	≥1	≤7	≥8	≤20	≥21
14	≤16.3	16.4–23.0	23.1	≥26.5	≥15	≤13	≥14	≤1	≥2	≤8	≥9	≤23	≥24
15	≤16.8	16.9–23.7	23.8	≥27.2	≥15	≤15	≥16	≤2	≥3	≤9	≥10	≤23	≥24
16	≤17.4	17.5–24.5	24.6	≥27.9	≥15	≤17	≥18	≤4	≥5	≤11	≥12	≤23	≥24
17	≤18.0	18.1–24.9	25.0	≥28.6	≥15	≤17	≥18	≤4	≥5	≤13	≥14	≤23	≥24

Age (yr.)	Trunk lift (in.)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)	
	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>
10	≤8	9–12	F	P	≤7	8
11	≤8	9–12	F	P	≤7	8
12	≤8	9–12	F	P	≤7	8
13	≤8	9–12	F	P	≤7	8
14	≤8	9–12	F	P	≤7	8
15	≤8	9–12	F	P	≤7	8
16	≤8	9–12	F	P	≤7	8
17	≤8	9–12	F	P	≤7	8

- NI and AFZ lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013). AFZ lap range represents a 3 percent reduction from VO<sub>2</sub> max standard for the general population. Where appropriate, youngsters with visual impairment should pursue standards for the HFZ.
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- Based on data from Project Target (1998).
- Based on data from The Cooper Institute (1999).
- The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65, 101.

**Fitness Zone Table 6** Girls With Visual Impairment (Blindness)

Age (yr.)	PACER (20 m laps)			1-mile run (VO <sub>2</sub> MAX)			TAMT (pass/fail)		Percent body fat <sup>c</sup>				Triceps and calf skinfold <sup>f</sup> (mm)
	NI <sup>a</sup>	AFZ <sup>a</sup>	HFZ <sup>b</sup>	NI	AFZ <sup>a</sup>	HFZ <sup>c</sup>	NI	HFZ <sup>d</sup>	>Very lean	HFZ	NI	NI (health risk)	HFZ
10	≤12	13–16	≥17	≤38.9	39.0–40.1	≥40.2	F	P	≤11.5	11.6–24.3	24.4	≥33.0	11–32
11	≤15	16–19	≥20	≤38.9	39.0–40.1	≥40.2	F	P	≤12.1	12.2–25.7	25.8	≥34.5	12–34
12	≤18	19–22	≥23	≤38.8	38.9–40.0	≥40.1	F	P	≤12.6	12.7–26.7	26.8	≥35.5	13–36
13	≤20	21–24	≥25	≤38.4	38.5–39.6	≥39.7	F	P	≤13.3	13.4–27.7	27.8	≥36.3	14–37
14	≤22	23–26	≥27	≤38.1	38.2–39.3	≥39.4	F	P	≤13.9	14.0–28.5	28.6	≥36.8	15–39
15	≤25	26–29	≥30	≤37.8	37.9–39.0	≥39.1	F	P	≤14.5	14.6–29.1	29.2	≥37.1	16–40
16	≤27	28–31	≥32	≤37.6	37.7–38.8	≥38.9	F	P	≤15.2	15.3–29.7	29.8	≥37.4	17–41
17	≤30	31–34	≥35	≤37.5	37.6–38.7	≥38.8	F	P	≤15.8	15.9–30.4	30.5	≥37.9	18–42

Age (yr.)	Body mass index <sup>c</sup>			Flexed-arm hang (sec.)		Push-up (# completed)		Pull-up (# completed)		Modified pull-up (# completed)		Curl-up (# completed)	
	Very lean	HFZ	NI	NI (health risk)	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>a</sup>	NI	NI	HFZ <sup>c</sup>
10	≤14.2	14.3–20.3	20.4	≥23.6	≤3	≥4	≤6	≥7	0	≥1	≤3	≤11	≥12
11	≤14.6	14.7–21.2	21.3	≥24.7	≤5	≥6	≤6	≥7	0	≥1	≤3	≤14	≥15
12	≤15.1	15.2–22.1	22.2	≥25.8	≤6	≥7	≤6	≥7	0	≥1	≤3	≤17	≥18
13	≤15.6	15.7–22.9	23.0	≥26.8	≤7	≥8	≤6	≥7	0	≥1	≤3	≤17	≥18
14	≤16.1	16.2–23.6	23.7	≥27.7	≤7	≥8	≤6	≥7	0	≥1	≤3	≤17	≥18
15	≤16.6	16.7–24.3	24.4	≥28.5	≤7	≥8	≤6	≥7	0	≥1	≤3	≤17	≥18
16	≤17.0	17.1–24.8	24.9	≥29.3	≤7	≥8	≤6	≥7	0	≥1	≤3	≤17	≥18
17	≤17.4	17.5–24.9	25.0	≥30.0	≤7	≥8	≤6	≥7	0	≥1	≤3	≤17	≥18

Age (yr.)	Trunk lift (in.)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)	
	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>
10	≤8	9–12	F	P	≤8	9
11	≤8	9–12	F	P	≤9	10
12	≤8	9–12	F	P	≤9	10
13	≤8	9–12	F	P	≤9	10
14	≤8	9–12	F	P	≤9	10
15	≤8	9–12	F	P	≤11	12
16	≤8	9–12	F	P	≤11	12
17	≤8	9–12	F	P	≤11	12

- NI and AFZ lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013). AFZ lap range represents a 3 percent reduction from VO<sub>2</sub>max standard for the general population. Where appropriate, youngsters with visual impairment should pursue standards for the HFZ.
- Reprinted, by permission, from The Cooper Institute, 2014, *Goal setting chart for aerobic capacity and PACER test*
- Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 62.
- Based on data from Project Target (1998).
- Based on data from The Cooper Institute (1999).
- The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66, 102.

**Fitness Zone Table 7 Boys With Spinal Cord Injury**

Age (yr.)	TAMT (pass/fail)		Percent body fat <sup>b</sup>			Triceps and calf skinfold <sup>b,c</sup> (mm)	Reverse curl (# completed)	Seated push-up (# completed)	Bench press (# completed)	Dumbbell press (# completed)
	NI	HFZ <sup>a</sup>	Very lean	HFZ	NI	NI	AFZ <sup>a</sup>	NI	NI	HFZ <sup>a</sup>
10	F	P	≤8.8	8.9–22.4	22.5	11–29	0	≥1	≥5–20	NI
11	F	P	≤8.7	8.8–23.6	23.7	11–31	0	≥1	≥5–20	NI
12	F	P	≤8.3	8.4–23.6	23.7	10–31	0	≥1	≥5–20	NI
13	F	P	≤7.7	7.8–22.8	22.9	9–30	0	≥1	≥5–20	NI
14	F	P	≤7.0	7.1–21.3	21.4	8–28	0	≥1	≥5–20	NI
15	F	P	≤6.5	6.6–20.1	20.2	8–26	0	≥1	≥5–20	NI
16	F	P	≤6.4	6.5–20.1	20.2	8–26	0	≥1	≥5–20	NI
17	F	P	≤6.6	6.7–20.9	21.0	8–27	0	≥1	≥5–20	NI

Age (yr.)	Grip strength (kg)		Modified Apley (score)		Modified Thomas (score)		Target stretch (score)	
	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>
10	≤17	≥18	≤2	3	≤2	3	≤1	2
11	≤20	≥21	≤2	3	≤2	3	≤1	2
12	≤24	≥25	≤2	3	≤2	3	≤1	2
13	≤28	≥29	≤2	3	≤2	3	≤1	2
14	≤32	≥33	≤2	3	≤2	3	≤1	2
15	≤36	≥37	≤2	3	≤2	3	≤1	2
16	≤42	≥43	≤2	3	≤2	3	≤1	2
17	≤48	≥49	≤2	3	≤2	3	≤1	2

- a. Based on data from Project Target (1998).  
b. Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 61.  
c. The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65, 101.

**Fitness Zone Table 8** Girls With Spinal Cord Injury

Age (yr.)	TAMT (pass/fail)		Percent body fat <sup>b</sup>			Triceps and calf skinfold <sup>b,c</sup> (mm)	Reverse curl (# completed)	Seated push-up (# completed)	Bench press (# completed)	Dumbbell press (# completed)
	NI	HFZ <sup>a</sup>	Very lean	HFZ	NI	NI	NI	NI	NI	NI
10	F	P	≤11.5	11.6–24.3	24.4	NI	0	≥1	HFZ <sup>a</sup>	HFZ <sup>a</sup>
11	F	P	≤12.1	12.2–25.7	25.8	11–32	0	≥5–20		
12	F	P	≤12.6	12.7–26.7	26.8	12–34	0	≥5–20		
13	F	P	≤13.3	13.4–27.7	27.8	13–36	0	≥5–20		
14	F	P	≤13.9	14.0–28.5	28.6	14–37	0	≥5–20	10–50	5–50
15	F	P	≤14.5	14.6–29.1	29.2	15–39	0	≥5–20	13–50	7–50
16	F	P	≤15.2	15.3–29.7	29.8	16–40	0	≥5–20	14–50	10–50
17	F	P	≤15.8	15.9–30.4	30.5	17–41	0	≥5–20	14–50	11–50
						18–42	0	≥5–20	15–50	11–50

Age (yr.)	Grip strength (kg)		Modified Apley (score)		Modified Thomas (score)		Target stretch (score)	
	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>
10	≤16	≥17	≤2	3	≤2	3	≤1	2
11	≤18	≥19	≤2	3	≤2	3	≤1	2
12	≤21	≥22	≤2	3	≤2	3	≤1	2
13	≤23	≥24	≤2	3	≤2	3	≤1	2
14	≤25	≥26	≤2	3	≤2	3	≤1	2
15	≤28	≥29	≤2	3	≤2	3	≤1	2
16	≤28	≥29	≤2	3	≤2	3	≤1	2
17	≤28	≥29	≤2	3	≤2	3	≤1	2

a. Based on data from Project Target (1998).

b. Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 62.

c. The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66, 102.



**Fitness Zone Table 9 Boys With Cerebral Palsy**

Age (yr.)	TAMT (pass/fail)		Percent body fat <sup>b</sup>				Triceps and calf skinfold <sup>b,c</sup> (mm)	Body mass index <sup>b</sup>			Seated push-up (# completed)		
	NI	HFZ <sup>a</sup>	Very lean	HFZ	NI	NI (health risk)	HFZ	Very lean	HFZ	NI	NI (health risk)	NI	AFZ <sup>a</sup>
10	F	P	≤8.8	8.9–22.4	22.5	≥33.2	11–29	≤14.4	14.5–19.7	19.8	≥22.7	≤4	≥5–20
11	F	P	≤8.7	8.8–23.6	23.7	≥35.4	11–31	≤14.8	14.9–20.5	20.6	≥23.7	≤4	≥5–20
12	F	P	≤8.3	8.4–23.6	23.7	≥35.9	10–31	≤15.2	15.3–21.3	21.4	≥24.7	≤4	≥5–20
13	F	P	≤7.7	7.8–22.8	22.9	≥35.0	9–30	≤15.7	15.8–22.2	22.3	≥25.6	≤4	≥5–20
14	F	P	≤7.0	7.1–21.3	21.4	≥33.2	8–28	≤16.3	16.4–23.0	23.1	≥26.5	≤4	≥5–20
15	F	P	≤6.5	6.6–20.1	20.2	≥31.5	8–26	≤16.8	16.9–23.7	23.8	≥27.2	≤4	≥5–20
16	F	P	≤6.4	6.5–20.1	20.2	≥31.6	8–26	≤17.4	17.5–24.5	24.6	≥27.9	≤4	≥5–20
17	F	P	≤6.6	6.7–20.9	21.0	≥33.0	8–27	≤18.0	18.1–24.9	25.0	≥28.6	≤4	≥5–20

Age (yr.)	40 m push/walk (pass/fail)		Wheelchair ramp test (feet)		Dumbbell press (# completed)		Grip strength (kg)		Modified Apley (score)			Modified Thomas (score)			Target stretch (score)		
	NI	AFZ <sup>a</sup>	NI	AFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	AFZ <sup>c</sup>	HFZ <sup>a</sup>	NI	AFZ <sup>d</sup>	HFZ <sup>a</sup>	NI	AFZ	HFZ <sup>a</sup>
10	F	P	≤7	≥8-15			≤17	≥18	≤1	2	3	≤1	2	3	0	1	2
11	F	P	≤7	≥8-15			≤20	≥21	≤1	2	3	≤1	2	3	0	1	2
12	F	P	≤7	≥8-15			≤24	≥25	≤1	2	3	≤1	2	3	0	1	2
13	F	P	≤7	≥8-15	≤13	14-50	≤28	≥29	≤1	2	3	≤1	2	3	0	1	2
14	F	P	≤7	≥8-15	≤18	19-50	≤32	≥33	≤1	2	3	≤1	2	3	0	1	2
15	F	P	≤7	≥8-15	≤20	21-50	≤36	≥37	≤1	2	3	≤1	2	3	0	1	2
16	F	P	≤7	≥8-15	≤23	24-50	≤42	≥43	≤1	2	3	≤1	2	3	0	1	2
17	F	P	≤7	≥8-15	≤26	27-50	≤48	≥49	≤1	2	3	≤1	2	3	0	1	2

- a. Based on data from Project Target (1998).  
b. Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65.  
c. AFZ is appropriate for classes C1 and C2L. When this test is recommended for other classes of cerebral palsy, use HFZ.  
d. AFZ is appropriate for classes C5 and C7 (affected side). When this test is recommended for other classes of cerebral palsy, use HFZ.  
e. The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65, 101.

**Fitness Zone Table 10** Girls With Cerebral Palsy

Age (yr.)	TAMT (pass/fail)		Percent body fat <sup>b</sup>			Triceps and calf skinfold <sup>b,c</sup> (mm)		Body mass index <sup>b</sup>			Seated push-up (# completed)	
	NI	HFZ	Very lean	HFZ	NI	NI (health risk)	HFZ	Very lean	HFZ	NI	NI (health risk)	NI
10	F	P	≤11.5	11.6–24.3	24.4	≥33.0	11–32	≤14.2	14.3–20.3	20.4	≥23.6	NI
11	F	P	≤12.1	12.2–25.7	25.8	≥34.5	12–34	≤14.6	14.7–21.2	21.3	≥24.7	NI
12	F	P	≤12.6	12.7–26.7	26.8	≥35.5	13–36	≤15.1	15.2–22.1	22.2	≥25.8	NI
13	F	P	≤13.3	13.4–27.7	27.8	≥36.3	14–37	≤15.6	15.7–22.9	23.0	≥26.8	NI
14	F	P	≤13.9	14.0–28.5	28.6	≥36.8	15–39	≤16.1	16.2–23.6	23.7	≥27.7	NI
15	F	P	≤14.5	14.6–29.1	29.2	≥37.1	16–40	≤16.6	16.7–24.3	24.4	≥28.5	NI
16	F	P	≤15.2	15.3–29.7	29.8	≥37.4	17–41	≤17.0	17.1–24.8	24.9	≥29.3	NI
17	F	P	≤15.8	15.9–30.4	30.5	≥37.9	18–42	≤17.4	17.5–24.9	25.0	≥30.0	NI

Age (yr.)	40 m push/walk (pass/fail)		Wheelchair ramp test (feet)		Dumbbell press (# completed)		Grip strength (kg)		Modified Apley (score)			Modified Thomas (score)			Target stretch (score)	
	NI	AFZ <sup>a</sup>	NI	AFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	HFZ <sup>a</sup>	NI	AFZ <sup>c</sup>	NI	HFZ <sup>a</sup>	NI	AFZ <sup>d</sup>	NI	AFZ
10	F	P	≤7	≥8–15			≤16	≥17	≤1	2	3	3	0	2	0	1
11	F	P	≤7	≥8–15			≤18	≥19	≤1	2	3	3	0	2	0	1
12	F	P	≤7	≥8–15			≤21	≥22	≤1	2	3	3	0	2	0	1
13	F	P	≤7	≥8–15	≤4	5–50	≤23	≥24	≤1	2	3	3	0	2	0	1
14	F	P	≤7	≥8–15	≤6	7–50	≤25	≥26	≤1	2	3	3	0	2	0	1
15	F	P	≤7	≥8–15	≤9	10–50	≤28	≥29	≤1	2	3	3	0	2	0	1
16	F	P	≤7	≥8–15	≤10	11–50	≤28	≥29	≤1	2	3	3	0	2	0	1
17	F	P	≤7	≥8–15	≤10	11–50	≤28	≥29	≤1	2	3	3	0	2	0	1

- Based on data from Project Target (1998).
- Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66.
- AFZ is appropriate for classes C1 and C2L. When this test is recommended for other classes of cerebral palsy, use HFZ.
- AFZ is appropriate for classes C5 and C7 (affected side). When this test is recommended for other classes of cerebral palsy, use HFZ.
- The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66, 102.

**Fitness Zone Table 11** Boys With Congenital Anomaly or Amputation

Age (yr.)	PACER (20 m laps)		1-mile run <sup>c,d</sup> ( $\dot{V}O_2$ MAX)		TAMT (pass/fail)		Percent body fat <sup>e</sup>			Triceps and calf skinfold <sup>e,f</sup> (mm)	Seated push-up (# completed)		
	NI <sup>a</sup>	HFZ <sup>b</sup>	NI (health risk)	NI	HFZ	NI	HFZ <sup>g</sup>	Very lean	HFZ	NI (health risk)	NI	AFZ <sup>h</sup>	
10	≤16	≥17	≤37.3	37.4–40.1	≥40.2	F	P	≤8.8	8.9–22.4	≥33.2	22.5	≤4	≥5–20
11	≤19	≥20	≤37.3	37.4–40.1	≥40.2	F	P	≤8.7	8.8–23.6	≥35.4	23.7	≤4	≥5–20
12	≤22	≥23	≤37.6	37.7–40.2	≥40.3	F	P	≤8.3	8.4–23.6	≥35.9	23.7	≤4	≥5–20
13	≤28	≥29	≤38.6	38.7–41.0	≥41.1	F	P	≤7.7	7.8–22.8	≥35.0	22.9	≤4	≥5–20
14	≤35	≥36	≤39.6	39.7–42.4	≥42.5	F	P	≤7.0	7.1–21.3	≥33.2	21.4	≤4	≥5–20
15	≤41	≥42	≤40.6	40.7–43.5	≥43.6	F	P	≤6.5	6.6–20.1	≥31.5	20.2	≤4	≥5–20
16	≤46	≥47	≤41.0	41.1–44.0	≥44.1	F	P	≤6.4	6.5–20.1	≥31.6	20.2	≤4	≥5–20
17	≤49	≥50	≤41.2	41.3–44.1	≥44.2	F	P	≤6.6	6.7–20.9	≥33.0	21.0	≤4	≥5–20

Age (yr.)	Bench press (# completed)		Dumbbell press (# completed)		Grip strength (kg)		Curl-up (# completed)		Trunk lift (in.)		Modified Apley (score)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)		Target stretch (score)	
	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>e</sup>
10					≤17	≥18	≤11	≥12	≤8	9–12	2	3	F	P	≤7	8	≤1	2
11					≤20	≥21	≤14	≥15	≤8	9–12	2	3	F	P	≤7	8	≤1	2
12					≤24	≥25	≤17	≥18	≤8	9–12	2	3	F	P	≤7	8	≤1	2
13	≤19	20–50	≤13	14–50	≤28	≥29	≤20	≥21	≤8	9–12	2	3	F	P	≤7	8	≤1	2
14	≤32	33–50	≤18	19–50	≤32	≥33	≤23	≥24	≤8	9–12	2	3	F	P	≤7	8	≤1	2
15	≤39	40–50	≤20	21–50	≤36	≥37	≤23	≥24	≤8	9–12	2	3	F	P	≤7	8	≤1	2
16	≤46	47–50	≤23	24–50	≤42	≥43	≤23	≥24	≤8	9–12	2	3	F	P	≤7	8	≤1	2
17	≤49	50	≤26	27–50	≤48	≥49	≤23	≥24	≤8	9–12	2	3	F	P	≤7	8	≤1	2

a. Lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013).

b. Reprinted, by permission, from The Cooper Institute, 2014, *Goal setting chart for aerobic capacity and PACER test*.

c. Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65.

d. Because the  $\dot{V}O_2$ max formula includes body mass index,  $\dot{V}O_2$ max will be overestimated if body mass index is not adjusted for the weight of a missing limb.

e. Based on data from Project Target (1998).

f. The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 65, 101.

**Fitness Zone Table 12** Girls With Congenital Anomaly or Amputation

Age (yr.)	PACER (20 m laps)		1-mile run <sup>c,d</sup> (VO <sub>2</sub> MAX)		TAMT (pass/fail)		Percent body fat <sup>b</sup>		Triceps and calf skinfold <sup>e,f</sup> (mm)		Seated push-up (# completed)	
	NI <sup>a</sup>	HFZ <sup>b</sup>	NI (health risk)	NI	HFZ <sup>b</sup>	NI	Very lean	HFZ	NI	NI (health risk)	NI	AFZ <sup>e</sup>
10	≤16	≥17	≤37.3	37.4–40.1	≥40.2	F	≤11.5	11.6–24.3	24.4	≥33.0	≤4	≥5–20
11	≤19	≥20	≤37.3	37.4–40.1	≥40.2	F	≤12.1	12.2–25.7	25.8	≥34.5	≤4	≥5–20
12	≤22	≥23	≤37.0	37.1–40.0	≥40.1	F	≤12.6	12.7–26.7	26.8	≥35.5	≤4	≥5–20
13	≤24	≥25	≤36.6	36.7–39.6	≥39.7	F	≤13.3	13.4–27.7	27.8	≥36.3	≤4	≥5–20
14	≤26	≥27	≤36.3	36.4–39.3	≥39.4	F	≤13.9	14.0–28.5	28.6	≥36.8	≤4	≥5–20
15	≤29	≥30	≤36.0	36.1–39.0	≥39.1	F	≤14.5	14.6–29.1	29.2	≥37.1	≤4	≥5–20
16	≤31	≥32	≤35.8	35.9–38.8	≥38.9	F	≤15.2	15.3–29.7	29.8	≥37.4	≤4	≥5–20
17	≤32	≥35	≤35.7	35.8–38.7	≥38.8	F	≤15.8	15.9–30.4	30.5	≥37.9	≤4	≥5–20

Age (yr.)	Bench press (# completed)		Dumbbell press (# completed)		Grip strength (kg)		Curl-up (# completed)		Trunk lift (in.)		Modified Apley (score)		Shoulder stretch (pass/fail)		Sit-and-reach (in.)		Target stretch (score)	
	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>c</sup>	NI	HFZ <sup>e</sup>	NI	HFZ <sup>e</sup>
10					≤16	≥17	≤11	≥12	≤8	9–12	2	3	F	P	≤8	9	≤1	2
11					≤18	≥19	≤14	≥15	≤8	9–12	2	3	F	P	≤9	10	≤1	2
12					≤21	≥22	≤17	≥18	≤8	9–12	2	3	F	P	≤9	10	≤1	2
13	≤9	10–50	≤4	5–50	≤23	≥24	≤17	≥18	≤8	9–12	2	3	F	P	≤9	10	≤1	2
14	≤12	13–50	≤6	7–50	≤25	≥26	≤17	≥18	≤8	9–12	2	3	F	P	≤9	10	≤1	2
15	≤13	14–50	≤9	10–50	≤28	≥29	≤17	≥18	≤8	9–12	2	3	F	P	≤11	12	≤1	2
16	≤13	14–50	≤10	11–50	≤28	≥29	≤17	≥18	≤8	9–12	2	3	F	P	≤11	12	≤1	2
17	≤14	15–50	≤10	11–50	≤28	≥29	≤17	≥18	≤8	9–12	2	3	F	P	≤11	12	≤1	2

a. Lap counts from Winnick and Short, 2014, developed with an equation provided by The Cooper Institute (2013).

b. Reprinted, by permission, from The Cooper Institute, 2014, *Goal setting chart for aerobic capacity and PACER test*.

c. Reprinted, by permission, from The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66.

d. Because the  $\dot{V}O_{2\max}$  formula includes body mass index,  $\dot{V}O_{2\max}$  will be overestimated if body mass index is not adjusted for the weight of a missing limb.

e. Based on data from Project Target (1998).

f. The Cooper Institute, 2013, *Fitnessgram/Activitygram test administration manual*, updated 4th ed. (Champaign, IL: Human Kinetics), 66, 102.