

Virginia Department of Education

HEALTH-RELATED FITNESS TESTING GUIDELINES

Revised in 2006

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Health-related fitness education is an important component of a physical education program. A well-designed fitness assessment process provides students, teachers, and parents with the necessary information to design an individualized program of fitness for each student.

The sequential program of physical fitness instruction in Virginia is based on the personal fitness strand in the Standards of Learning that focuses student learning on achievement of a health-enhancing level of physical fitness. Students who participate in effective physical fitness programs will be more likely to develop lifelong habits that promote health and learning.

The Virginia Standards of Learning personal fitness goal for elementary students is to become aware of health-related fitness components (cardio respiratory endurance, body composition and muscular endurance, strength and flexibility) while engaging in a variety of physical activities.

The Standards of Learning personal fitness goal for middle school students is to continue to learn more about the components of fitness, how they are developed and improved, how they interrelate, and how they contribute to overall fitness.

While in high school, students plan, implement, evaluate, and modify a personal, goal-driven fitness plan that enables them to achieve and maintain a level of fitness that allows them to meet their personal goals for various work-related, sport, and leisure activities.

A unit of fitness includes:

- Instruction on activities and fitness concepts.
- Student participation in conditioning activities.
- Instruction on test items.
- Assessment of fitness levels.
- Planning individualized fitness programs and setting goals.
- Promoting and tracking physical activity.
- Reassessment of fitness levels.

The Virginia fitness testing program provides basic health-related fitness assessments to help students identify areas of fitness that are directly linked to overall quality of life. Health-related fitness includes the five major components of fitness directly related to improvement of health.

1. Cardiorespiratory Endurance --- the ability of the blood vessels, heart and lungs to take in, transport, and utilize oxygen. This is a critically important component of fitness because it impacts other components of fitness and decreases the risk of cardiovascular diseases.
2. Muscular Strength --- the maximum amount of force a muscle or muscle groups can exert.
3. Muscular Endurance --- the length of time a muscle or muscle group can exert force prior to fatigue.

4. Flexibility --- the range of motion in the joints.
5. Body Composition --- the amount of fat versus lean mass (bone, muscle, connective tissue, and fluids). While some fat is essential for insulation and providing energy, too much fat can cause serious health problems.

In addition to improving quality of life, health-related fitness:

- increases muscle tone and strength;
- decreases susceptibility to injuries and illness;
- improves bone mineral density;
- reduces risk of osteoporosis;
- improves posture;
- increases efficiency of the respiratory and circulatory systems;
- decreases risk of cardiovascular disease and stroke;
- improves blood pressure;
- decreases risk of diabetes and some cancers;
- improves self-esteem and self-confidence;
- decreases body fat and improves metabolism; and
- increases energy level and academic achievement.

Fit students feel better, look better, have more energy and are better learners. Physical education programs in Virginia provide students with the essential knowledge and skills to design a basic exercise prescription for improving each component of health-related fitness. This fitness plan includes Frequency, Intensity, Time and Type of exercise, also referred to as the "F.I.T.T. Formula".

In addition, students study key training principles to improve health-related fitness. These include the principles of overload, progression, specificity, reversibility, and individuality. Physical education students will also learn to apply the skill-related physical fitness components of agility, balance, coordination, reaction time, speed and power for successful execution of sports-related skills.

Physically educated students in Virginia have the basic health literacy to be empowered to continue a personal fitness program for a lifetime.

Virginia and many other states have used the Cooper Institute FITNESSGRAM® standards as the state-designated fitness test for the last few decades. The FitnessGram's® criterion-referenced science-based approach identifies the physical fitness test items that assess the important aspects of a student's health-related fitness. They evaluate functional fitness not "athletic" fitness levels. On the Cooper Institute FITNESSGRAM® tests, students are NOT compared to each other, but to health-related fitness standards established for each age and gender that indicate good health.

The Cooper Institute's scientific research and validation work conducted over many years have refined these standards and have yielded a few changes to the 2006 fitness area tests, the Healthy Fitness Zones (HFZs), and the data reporting requirements.

Recommended Tests

The following five health-related fitness tests are the recommended.

- The Pacer,
- Abdominal Strength Curl-up,
- Trunk Lift,
- 90 degree push up
- Flexibility.

NOTE: Body composition testing (skinfold or BMI) are optional.

Healthy Fitness Zone Criteria Changes for 2006

The Healthy Fitness Zones (HFZs), or performance standards for the Progressive Aerobic Cardiovascular Endurance Run (PACER) have been modified to align with the HFZs for the Walk Test. The past version of the PACER used standards based on the laps completed in order to avoid large age and gender disparities in the HFZs. These adjustments, however, led to inconsistencies with the estimates of VO₂ max scores used to standardize the two different assessments of aerobic capacity. (The VO₂ max score reflects the maximum rate that oxygen can be taken into and used by the body during exercise.) The FITNESSGRAM® Scientific Advisory Board determined it was more appropriate to maintain the alignment with the other tests. Therefore, the original HFZs for the PACER have been reinstated.

Fitness Test Changes Instituted in 2006

The Pull-Up is no longer an option on the FITNESSGRAM®. Very few students can successfully perform even one pull-up, and the assessment does not provide a good indicator of upper body strength. The ability to perform a pull-up is not predictive of good health or fitness. The FITNESSGRAM® Scientific Advisory Board has removed the test as an option in the FITNESSGRAM® test battery. The removal of this test option requires teachers to select from the Push-Up, the Modified Pull-Up, or the Flexed-Arm Hang to measure upper body strength and endurance.

The Walk Test has been added as an optional test for secondary students. The shoulder stretch test has been added to the flexibility tests.

The Trunk Lift test has been added to as a recommended test. The trunk lift measures trunk extensor strength and flexibility - for low back health and proper vertebral alignment.

The 2006 assessment program includes recommended test items in the following two areas of fitness: Aerobic Capacity and Muscle Strength, Endurance, and Flexibility. While an important component of health-related fitness, due to sensitive issues surrounding body composition the decision to collect and report this data is a local option.

Aerobic Capacity (select one)

- The PACER - a 20 meter progressive, multi-stage shuttle run set to music (it is now also available in a 15 meter distance). (recommended)
- Walk Test - for students ages 13 or older (recommended)
 - Rockport Fitness Walking Test
 - <http://walking.about.com/library/cal/ucrockport.htm> - for an online calculator
- One Mile Walk/Run (option)

Aerobic capacity is the most important area of any fitness program. The PACER, Walk Test and the Mile Walk/Run provide estimates of $VO_2\text{max}$, so direct comparisons can be made between the results of these tests.

If you are not administering all the tests, the PACER is one of the recommended tests because students are more likely to have a positive experience, and students who have a poorer performance will finish first and not be subject to the embarrassment of being the last person to finish the test.

The other recommended test is the Walk Test because it is an assessment that can be used for a lifetime. Secondary students should learn about this assessment since it is one they can repeat on their own to self-assess their fitness levels. This test is based on the Rockport Fitness Walking Test. Online calculator may be found at <http://walking.about.com/library/cal/ucrockport.htm>.

Muscle Strength, Endurance, and Flexibility

- Abdominal Strength Curl-up Test - measures strength and endurance of abdominal muscles (recommended test)
- Trunk Lift - measures trunk extensor strength and flexibility - for low back health and proper vertebral alignment (recommended test)

Upper Body Strength (select one)

- 90 degree Push-up - strength and endurance of muscles in the upper body are important in activities of daily living and promoting good posture (recommended)
- Flexed Arm Hang (option)
- Modified Pull-up (option)

Flexibility (select one)

- Back-saver Sit-and-reach (recommended)
- Shoulder Stretch

Tests of muscular strength, muscular endurance, and flexibility have been combined into one broad fitness category to determine the functional health status of the musculoskeletal system. It is equally important to have strong muscles that can work forcefully over a period of time that are flexible enough to allow full range of motion at the joint.

Body Composition (optional reporting category)

- Percent body fat (Skinfold Measurement is the recommended test)
- Body mass index (option)

Data indicate that obesity among children is on the increase. Obesity is present when total body weight is more than 25 percent fat in boys and more than 32 percent fat in girls. Although childhood obesity is often defined as a weight-for-height in excess of 120 percent of the ideal, skinfold measures are more accurate determinants of fatness.

Obesity presents numerous problems for the child. In addition to negatively impacting learning and increasing the risk of obesity in adulthood, childhood obesity is the leading cause of pediatric hypertension, is associated with Type II diabetes mellitus, increases the risk of coronary heart disease, increases stress on the weight-bearing joints, lowers self-esteem, and affects grades and relationships with peers. Some authorities feel that social and psychological problems are the most significant consequences of obesity in children.

Inappropriate Uses of Fitness Testing

Grading students on their fitness performance may be holding them accountable for accomplishments beyond their control and is **NOT recommended**. Fitness capacity, like blood cholesterol, is largely determined by genetics. Changes in body fatness and body size have major effects on fitness test performance. During periods of rapid maturational change, children may experience an increase or decrease in their abilities to perform on certain tests completely independent of their levels of physical activity.

Posting the test results for other students to see can create an embarrassing situation that does little to foster positive attitude toward activity and fitness.

Grading students on their understanding of fitness concepts, what the tests measure, designing a personalized fitness program and types of fitness-enhancing activities are appropriate measures of student learning.

Students make choices that impact their health. Students who understand and value good nutrition and physical fitness will be more likely to make better choices and develop lifelong habits that maximize health.

Promoting physical fitness is only one part of a quality physical education program. Teaching physical skills, cooperative skills, and health maintenance skills are equally important objectives for promoting lifelong physical activity.

Interpreting Performance on Physical Fitness Assessments

The primary reason for testing is to provide the student with data to be used in planning a personal fitness plan. FITNESSGRAM uses criterion-referenced standards to evaluate

fitness performance. These standards represent a level of fitness that offers some degree of protection against sedentary lifestyle diseases. Performance is classified in two general areas: “Healthy Fitness Zone” and “Needs Improvement”. The healthy fitness zone indicates the child has a sufficient level of functional fitness. The needs improvement zone indicates that the child may be at risk if that level of fitness stays the same over time.

The healthy fitness zone represents a range of scores (by sex and age) that would provide health benefits if the same level of fitness is maintained into adulthood. There is an upper range on the healthy fitness zone because epidemiological evidence suggests that the additional improvements from progressively higher levels of fitness are not significant.

Test Administration Resources

To purchase a FitnessGram test kit, administrative manual, and 8.0 software package go to <http://www.fitnessgram.net/> or visit Human Kinetics at www.HumanKinetics.com

FitnessGram Testing Protocols

To access the FitnessGram testing protocols and the healthy fitness zone criteria go to www.FitnessGram.net/protocols.

Enter your e-mail address and your authorization code is: **“VATEACHERS”**. The code is not case sensitive.

Click on each test for testing objectives, instructions, administration, equipment needs, scoring, and other information. The Boys and Girls’ Healthy Fitness Zone Criteria are located at the bottom of the list of tests.

Virginia's Fitness Test Reporting Categories

Instituted in 2006-07

1. Aerobic Capacity

*PACER

One Mile Run/Walk

One Mile Walk Test

2. Upper Body Strength and Endurance

*90 Degree Push-Up

Modified Pull-Up

Flexed Arm Hang

3. Abdominal Strength and Endurance

*Curl-Up Cadence

4. Trunk Extensor Strength

*Trunk Lift

5. Flexibility

*Back-Saver Sit and Reach

Shoulder Stretch

6. Body Composition (optional)

Skinfold Measurement (optional)

Body Mass Index (BMI) (optional)

*recommended tests

TABLE 9.1 FITNESSGRAM Standards for Healthy Fitness Zone

BOYS														
Age	$\dot{V}O_2\text{max}$ (ml · kg ⁻¹ · min ⁻¹)		20-meter PACER (Enter # laps in software)		15-meter PACER (Use conversion chart; enter in software)†		One-mile run (min:sec)		Walk test ($\dot{V}O_2\text{max}$)		Percent fat		Body mass index	
5			Participation in run. Lap count standards not recommended.				Completion of distance. Time standards not recommended.				25	10	20	14.7
6											25	10	20	14.7
7											25	10	20	14.9
8											25	10	20	15.1
9											25	7	20	13.7
10	42	52	23	61	30	80	11:30	9:00			25	7	21	14.0
11	42	52	23	72	30	94	11:00	8:30			25	7	21	14.3
12	42	52	32	72	42	94	10:30	8:00			25	7	22	14.6
13	42	52	41	83	54	108	10:00	7:30	42	52	25	7	23	15.1
14	42	52	41	83	54	108	9:30	7:00	42	52	25	7	24.5	15.6
15	42	52	51	94	67	123	9:00	7:00	42	52	25	7	25	16.2
16	42	52	61	94	80	123	8:30	7:00	42	52	25	7	26.5	16.6
17	42	52	61	106	80	138	8:30	7:00	42	52	25	7	27	17.3
17+	42	52	72	106	94	138	8:30	7:00	42	52	25	7	27.8	17.8

Age	Curl-up (no. completed)		Trunk lift (inches)		90° push-up (no. completed)		Modified pull-up (no. completed)		Flexed arm hang (seconds)		Back-saver sit and reach* (inches)	Shoulder stretch
5	2	10	6	12	3	8	2	7	2	8	8	Healthy Fitness Zone = touching fingertips together behind the back on both the right and left sides.
6	2	10	6	12	3	8	2	7	2	8	8	
7	4	14	6	12	4	10	3	9	3	8	8	
8	6	20	6	12	5	13	4	11	3	10	8	
9	9	24	6	12	6	15	5	11	4	10	8	
10	12	24	9	12	7	20	5	15	4	10	8	
11	15	28	9	12	8	20	6	17	6	13	8	
12	18	36	9	12	10	20	7	20	10	15	8	
13	21	40	9	12	12	25	8	22	12	17	8	
14	24	45	9	12	14	30	9	25	15	20	8	
15	24	47	9	12	16	35	10	27	15	20	8	
16	24	47	9	12	18	35	12	30	15	20	8	
17	24	47	9	12	18	35	14	30	15	20	8	
17+	24	47	9	12	18	35	14	30	15	20	8	

Number on left is lower end of HFZ; number on right is upper end of HFZ.

*Test scored Pass/Fail; must reach this distance to pass.

†Conversion chart on page 94.

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TABLE 9.2 FITNESSGRAM Standards for Healthy Fitness Zone

GIRLS														
Age	$\dot{V}O_2\text{max}$ (ml · kg ⁻¹ · min ⁻¹)		20-meter PACER (Enter # laps in software)		15-meter PACER (Use conversion chart; enter in software)†		One-mile run (min:sec)		Walk test ($\dot{V}O_2\text{max}$)		Percent fat		Body mass index	
5			Participation in run. Lap count standards not recommended.				Completion of distance. Time stan- dards not re- commended.				32	17	21	16.2
6											32	17	21	16.2
7											32	17	22	16.2
8											32	17	22	16.2
9											32	13	23	13.5
10	39	47	7	41	9	54	12:30	9:30			32	13	23.5	13.7
11	38	46	15	41	19	54	12:00	9:00			32	13	24	14.0
12	37	45	15	41	19	54	12:00	9:00			32	13	24.5	14.5
13	36	44	23	51	30	67	11:30	9:00	36	44	32	13	24.5	14.9
14	35	43	23	51	30	67	11:00	8:30	35	43	32	13	25	15.4
15	35	43	32	51	42	67	10:30	8:00	35	43	32	13	25	16.0
16	35	43	32	61	42	80	10:00	8:00	35	43	32	13	25	16.4
17	35	43	41	61	54	80	10:00	8:00	35	43	32	13	26	16.8
17+	35	43	41	72	54	94	10:00	8:00	35	43	32	13	27.3	17.2

Age	Curl-up (no. completed)		Trunk lift (inches)		90° push-up (no. completed)		Modified push-up (no. completed)		Flexed arm hang (seconds)		Back-saver sit and reach* (inches)	Shoulder stretch
5	2	10	6	12	3	8	2	7	2	8	9	Healthy Fitness Zone = touching fingertips together behind the back on both the right and left sides.
6	2	10	6	12	3	8	2	7	2	8	9	
7	4	14	6	12	4	10	3	9	3	8	9	
8	6	20	6	12	5	13	4	11	3	10	9	
9	9	22	6	12	6	15	4	11	4	10	9	
10	12	26	9	12	7	15	4	13	4	10	9	
11	15	29	9	12	7	15	4	13	6	12	10	
12	18	32	9	12	7	15	4	13	7	12	10	
13	18	32	9	12	7	15	4	13	8	12	10	
14	18	32	9	12	7	15	4	13	8	12	10	
15	18	35	9	12	7	15	4	13	8	12	12	
16	18	35	9	12	7	15	4	13	8	12	12	
17	18	35	9	12	7	15	4	13	8	12	12	
17+	18	35	9	12	7	15	4	13	8	12	12	

Number on left is lower end of HFZ; number on right is upper end of HFZ.

*Test scored Pass/Fail; must reach this distance to pass.

†Conversion chart on page 94.

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VIRGINIA WELLNESS-RELATED FITNESS TEST SCHOOL SUMMARY

SCHOOL NAME:

DATE:

GRADE		Upper Body Strength and Endurance		Abdominal Strength and Endurance		Flexibility		Aerobic Capacity		Trunk		Body Composition (optional)	
		Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
4th	# tested												
	# met HFZ												
5th	# tested												
	# met HFZ												
6th	# tested												
	# met HFZ												
7th	# tested												
	# met HFZ												
8th	# tested												
	# met HFZ												
9th	# tested												
	# met HFZ												
10th	# tested												
	# met HFZ												
11th	# tested												
	# met HFZ												
12th	# tested												
	# met HFZ												

PRINCIPAL: _____

RETURN TO:
Central Office Designee

ADDRESS _____

TELEPHONE # () _____ E-MAIL _____

CUMULATIVE WELLNESS-RELATED FITNESS RECORD

Name: _____ Gender: _____ Date of Birth: _____

Last First Middle

Enter age of student at time best score was performed. Place an "Y" in the HFZ column when HFZ is met. "N" if not in zone.

	Grade	4th			5th			6th			7th			8th			9th			10th		
		Age at testing	Age at Best	Best Score	HFZ	Age at Best	Best Score	HFZ	Age at Best	Best Score	HFZ	Age at Best	Best Score	HFZ	Age at Best	Best Score	HFZ	Age at Best	Best Score	HFZ		
Upper-Body Strength and Endurance	*90 Degree Push Ups																					
	Modified Pull-Ups																					
	Flexed Arm Hang																					
Abdominal Strength and Endurance	*Curl-Up Cadence																					
Flexibility	Back-Saver Sit & Reach																					
	Shoulder Stretch																					
Aerobic Capacity	*Pacer																					
	One Mile Run/Walk																					
	One Mile Walk Test																					
Trunk Strength	*Trunk Lift																					
Body Composition (optional)	Skinfold Measurement (optional)																					
	Body Mass Index ((BMI) (optional)																					

* Recommended Test

HFZ = Healthy Fitness Zone

Suggested Modifications for Children with Disabilities for the FITNESSGRAM

Aerobic Capacity

* PACER

General Accommodations

1. Does not have to follow cadence.
2. Go up, and wait for peers to go up and back, then join peers again going back.
3. Walk one and run one (same if in wheelchair).
4. Run (push wheelchair) with a partner who can help with cadence and encouragement.
5. Set individual goals for child with disabilities (challenging but realistic).

* One Mile Walk/Run Test

1. Run (or push wheelchair) width and walk length (or vice versa).
2. Have smaller targets such as cones every 100 yards that child can run to and touch, then rest, then run to next cone.
3. Hold a bean bag and run drop it into bucket 100 yards away. Then pick up another bean bag to run and drop into another bucket 100 yards away.
4. Run (push wheelchair) with partner who can help with pace and encouragement (child who is blind can hold hands with peer or can hold a small rope between peer and child who is blind).
5. Set individual goals for child with disabilities (challenging but realistic).

Upper Body Strength and Endurance

* 90 Degree Push-Up

General Accommodations

1. Put something under child such as a book to make the distance the child has to go shorter.
2. Do reverse pushup - start in up position and slowly go down trying to resist flopping to the ground; repeat.
3. Have something on the back like a book to help get a feel for a straight back.
4. Put marks on the floor to help child understand correct hand position.
5. Physically assist child a few times to help get into correct position.
6. Practice against a wall to get correct straight back position.
7. Do modified push-up (knees bent)
7. Have a partner encourage and reinforce child.
8. Set individual goals for child with disabilities (challenging but realistic).
9. Push self up from wheelchair by pushing up in arm rests (similar to dips)

- | | |
|--------------------|---|
| * Modified Pull-Up | <ol style="list-style-type: none"> 1. Physically assist child to go up and down so child can get a feel for what is expected. 2. Allow child to hang for 1-2 seconds, rest, and then repeat (several times) 3. Have child do pull-ups while standing on chair, but have child try and support as much as self as possible with arms pulling up and down. 4. Have a partner encourage and reinforce child. 5. Set individual goals for child with disabilities (challenging but realistic). |
| * Flexed Arm Hang | <ol style="list-style-type: none"> 1. Physically assist child to hold position so child can get a feel for what is expected. 2. Allow child to hang for 1-2 seconds, rest, then repeat (several times) 3. Hang while standing on chair, but have child try and bend knees and support as much as self as possible with arms 4. Allow straight arm hang for as long as possible. 5. Have a partner encourage and reinforce child. 6. Set individual goals for child with disabilities (challenging but realistic). |

Abdominal Strength
and Endurance

General Accommodations

- | | |
|-------------------|---|
| * Curl-Up Cadence | <ol style="list-style-type: none"> 1. Do without cadence 2. Physically assist a few times to show how to do it correctly. 3. Have visual and tactile cues for where hands should start and how far they should go. 4. Do reverse sit up – start in up position and resist as you fall back to mat. Repeat several times. 5. Allow child to hold onto knees and just lean back and forth to get some work on abdominals. 6. Hold child's hands or hold stick and gently assist child allowing child to do as much work as possible. 7. Have child do sit ups on inclined wedge (or mats) to make it easier to sit up. 8. Have a partner encourage and reinforce child. 9. Set individual goals for child with disabilities (challenging but realistic). |
|-------------------|---|

Trunk Extensor Strength

* Trunk Lift

General Accommodations

1. Physically assist a few times to show how to do it correctly.
2. Have visual and tactile cues to help child understand that he/she has lifted arms and legs correctly.
3. Hold for count of 2, rest, then repeat (do several times)
4. Have a partner encourage and reinforce child.
5. Set individual goals for child with disabilities (challenging but realistic).

Flexibility

* Back-Saver Sit and Reach

General Accommodations

1. Physically assist a few times to show how to do it correctly.
2. Start with easy task for success (e.g., touch knees). Then gradually ask child to move farther down leg.
3. Hold for shorter amount of time (e.g., 1-2 seconds), rest, and then repeat.
4. Put tape marks on leg as a visual/tactile goal.
5. Have a partner encourage and reinforce child.
6. Set individual goals for child with disabilities (challenging but realistic).

* Shoulder Stretch

1. Physically assist a few times to show how to do it correctly.
2. Start with easy task for success (e.g., just bring arm). Then gradually ask child to move farther down leg.
3. Hold for shorter amount of time (e.g., 1-2 seconds), rest, and then repeat
4. Put tape marks on back as a tactile cue for child.
5. Have a partner encourage and reinforce child.
6. Set individual goals for child with disabilities (challenging but realistic).

Body Composition (optional)

General Accommodations

* Skinfold Measurement

none needed

* Body Mass Index (BMI)

none needed

This technical assistance guide was prepared by: Martin E. Block, Ph.D., Kinesiology Program, University of Virginia, 210 Emmet St., S.. Box 400407, Charlottesville, VA 22904-4407

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