

Wellness comes from a commitment to a lifestyle of managing stress, eating healthy, and exercising regularly. **Physical fitness** is one component of wellness. Physical fitness is the ability to perform the most work with the least effort. Improved fitness requires an exercise program for **cardiovascular endurance, flexibility, muscular endurance, and muscular strength**. People who exercise regularly are stronger, more flexible, recover from hard work or illness more quickly, live longer, and, more importantly, have a better quality of life. A fit person is at a low risk for both fatigue and hypokinetic disease. (Hypokinetic diseases include, but are not limited to, heart disease, hypertension, arthritis, etc.) A fit person looks good, feels good, enjoys physical activity, and effectively deals with the stress of daily life. A commitment to fitness has been shown to:

- Relieve tension and stress
- Stimulate the mind
- Reduce body fat
- Control appetite
- Boost self-image
- Improve muscle tone and strength
- Improve performance
- Lower blood pressure
- Improve sleep
- Improve flexibility
- Lower cholesterol
- Increase resistance to illness

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How to recognize and measure fitness

There are eleven components that measure fitness. Six of these components are related to skill and sport, and five of these components are related to health. **The fitness tests given by High School District 211 measure health-related fitness.**

Measures of Health-Related Fitness:

Body-composition is the make-up of the body in fat, muscle, bone, and other tissue. Fat is expressed in percent (%) of body fat. The total of all other components is expressed in percent (%) of lean body mass.

Cardiovascular fitness is the ability of the heart, lungs and blood vessels to supply blood and oxygen to the body during long periods of exercise. The mile run measures cardiovascular fitness.

Flexibility is the ability to move a joint through a full range of motion. The sit and reach test measures flexibility of the lower spine.

Muscular endurance is the ability of a muscle or muscle group to continue work over a long period of time. The one minute sit-up test measures muscular endurance of the abdominals.

Muscular strength is the maximum amount of force a muscle or muscle group can exert. The pull-up test measures upper-body strength.

Measures of Skill-Related Fitness:

Agility is the ability of the body to change direction quickly. Dodging a tackle in football or soccer is an example.

Balance is the ability of the body to maintain equilibrium while stationary or moving. Performing a handstand (stationary) or skiing (moving) are examples of skills that use balance.

Coordination is the ability to combine muscles and/or muscle groups with the senses (sight, touch, etc.) to complete complex tasks. Juggling or hitting a ball are skills that require coordination.

Power is the combination of strength and speed. The volleyball spike is a power skill.

Reaction time is the amount of time between sensing and responding. The time needed to respond to a starter's gun to take-off for a race is an example of reaction time.

Speed is the ability to perform a movement in a short period of time. The 100 meter dash measures speed.

How to design an exercise program

AEROBIC TRAINING

Aerobic activities improve the fitness level of your cardiovascular system. This is the first step in any exercise program. Running, walking, swimming, and cycling at a continuous pace, maintained for 20 minutes or more in the Target Heart Rate (THR) zone, are all examples of aerobic exercise. Activities that use the larger muscles of the body over an extended period of time require an increase in the use of oxygen. To deliver more oxygen, the heart must pump more blood to the muscles. This increases the heart rate, and the body's adaptation to this change increases cardiac fitness.

The **training effect** from an aerobic exercise program occurs when the heart is overloaded by work for an extended period of time. An overload of 60-85% of the individual's maximum heart rate (MHR) determines the target heart rate zone (THR). The calculation of THR zone is the same for both male and females and is determined by age and current resting heart rate. Heart rate calculations are based on counting your pulse for one minute. The fit person's heart works more efficiently pumping at a slower rate because it pumps more blood with each beat. This means that a fit person will have to work harder (higher intensity) to increase his heart rate and his cardiovascular fitness. To determine THR zone **based on your age and current fitness level:**

1. Establish MHR by subtracting age from the scientific standard of 220.
2. Subtract resting heart rate (RHR) from of MHR. RHR is taken before getting out of bed in the morning.
3. First, multiply this number by .60 (60%) and then again by .85 (85%).
4. To each of these numbers add the RHR used in number 2.
5. These two numbers establish the lower and upper ends of the Target Heart Rate zone.

Aerobic Training: The Target Heart Rate (THR) Zone

	Low End		High End	
	Example	You	Example	You
Scientific Standard	220	220	220	220
Subtract age	$\frac{-14}{=206}$	$\frac{-}{=}$	$\frac{-14}{=206}$	$\frac{-}{=}$
1. Maximum Heart Rate (MHR)				
2. Subtract resting heart rate (RHR)	$\frac{-76}{=130}$		$\frac{-76}{=130}$	
3. Multiply by work intensity 60-85%	$\frac{\times .60}{=78}$	$\frac{\times .60}{=}$	$\frac{\times .85}{=110.5}$	$\frac{\times .85}{=}$
4. Add resting heart rate (RHR)	$\frac{+76}{=154}$	$\frac{+}{=}$	$\frac{+76}{=187}$	$\frac{+}{=}$
THR training zone for example				
5. Specific THR training zone	= _____ to _____ *			

*A quick way to estimate the middle of the training zone is to subtract age from 185.

When counting a heart rate for less than a full minute, always count the first beat as zero. This prevents an overestimation of heart rate when multiplying.

The F I T Formula determines the amount of exercise an individual gets in his fitness program. **F** stands for frequency-how often he exercises. **I** stands for intensity-how hard he exercises. **T** stands for time (duration)-how long he exercises. To maintain current aerobic (cardiovascular) fitness, exercise at a frequency of 3 times per week, at an intensity based on individualized goals and target heart rate, for a 20-30 minute duration.

FLEXIBILITY TRAINING

Flexibility training is a stretching program for muscles or muscle groups. Stretching is necessary so that all joints of the body can achieve and maintain their full range of motion. With age, flexibility decreases due to lack of activity. Aerobic exercise should precede flexibility training, because warmed muscles stretch more easily. Joints should be taken through their full range of motion as part of a warmup for activity or training. Also, flexibility training is used after exercise as part of a cool down. This helps prevent muscle cramping from strenuous use.

There are three types of stretches. A slow stretch held for 6-30 seconds is referred to as a **static stretch**. Static stretching is considered safe and effective to increase range of motion in a joint. **Proprioceptive neuromuscular facilitation (PNF) stretching** is also recommended as both safe and effective for increasing range of motion. PNF stretching uses a contraction of the muscle prior to the stretch. Most PNF stretches require the use of a partner. This may make PNF stretching less practical for all flexibility training situations. **Ballistic stretching** is sometimes used, but not recommended as a means of improving flexibility. The bouncy, jerky movement used in ballistic stretching increases the likelihood of injury.

ANAEROBIC TRAINING: RESISTANCE & SPEED TRAINING

After achieving aerobic fitness and flexibility, the body is ready for anaerobic training. **Anaerobic training** can refer to resistance (strength/weight training) or sprinting (speed training). **Resistance training** can be aimed at increasing muscle endurance or muscle strength. Muscle endurance is increased when a low resistance is moved many times. This is referred to as low resistance, high repetition. Muscle strength is developed when maximal resistance is moved, sometimes only one or two times. This is referred to as high resistance, low repetition. Weight training can be performed aerobically, but for increasing strength it is usually done anaerobically. Forty-eight hours of rest should be allowed before heavy lifting is repeated for the same muscle or muscle group.

Sprinting or speed training improves cardiac fitness. When short term, high intensity sprints are randomly placed within a normal aerobic workout, cardiac efficiency is challenged and eventually improved as the body adapts to change. Anaerobic sprints overload the body so that the demand for oxygen cannot be met. Therefore, the exercise intensity (resistance or speed) must be lowered or discontinued. High intensity work cannot be maintained for long periods of time in the absence of oxygen. Aerobic means continuous with oxygen, and anaerobic means short duration because no oxygen is available. Muscles can continue high intensity work for only a minute or two in the absence of oxygen.

NON-AEROBIC ACTIVITIES

Some activities are low intensity, and yet encourage general muscle strength, endurance, and/or flexibility. Climbing one flight of stairs, bowling, playing volleyball or tennis doubles are non-aerobic activities. Non-aerobic activities provide general exercise for the body, but do not challenge the body to improve fitness level.

How to choose a training format

Just like variety of food is important to nutrition, variety of training formats is important to exercise. Since the body increases its fitness level through the process of adaptation, change within the training format can improve the fitness level. There are three training formats:

Circuit training involves a series of exercises at different stations. In the weight room, moving from machine to machine is a weight circuit; in the CV fitness center, moving from bike to stepper to slide board is an aerobic circuit. Weight circuits can be done aerobically (to maintain or improve muscular and cardiac endurance) or anaerobically (to improve muscular strength). When a series of lifts are followed by a one minute aerobic activity, an aerobic/weight circuit is created. **Cross training** refers to meeting the exercise fitness goals with a variety of different activities. Running on Monday, biking on Wednesday, and hiking on the weekend is an example of a cross training program. Cross training prevents overuse syndrome (overusing the same muscles or muscle groups to the point of exhaustion followed by injury). **Interval training** simply alternates high intensity work with moderate or low intensity work. Sprint training used randomly within an aerobic workout is an example of interval training designed to increase the body's fitness level.

Regular participation in a variety of activities that emphasize different types and formats of training is necessary for total fitness.

NUTRITION

Nutrition is the foundation necessary to support a life of movement. While it is exercise that tears down the cells of the body, it is nutrition that supports the rebuilding that eventually improves fitness and wellness. Nutrition has six components. **Carbohydrates** can be both simple (sugars) and complex (starches). They are found in fruits, vegetables, and grains and supply the primary source of energy for high intensity anaerobic activity. Carbohydrates should comprise 58% or more of the diet, with less than 10 % coming from simple sugars. **Fats** are plentiful in the diet and are the primary source for long duration aerobic activity. The American Heart Association recommends that 30% or less of caloric consumption come from fat, with 10% or less from saturated fat. **Proteins** are found in meats and dairy products, as well as in combinations of complex carbohydrates. Proteins are used by the body to repair body tissue and regulate chemical function. **Vitamins and minerals** are found in a variety of complex carbohydrates, dairy products, and certain fish, meat, and poultry. Vitamins and minerals are often suggested as a food supplement, but are not necessary when a balanced diet using a variety of foods is eaten daily. **Water** is the final component of good nutrition. Eight, eight ounce glasses of water should be consumed daily. Water is important and necessary to hydrate the aerobic participant.

FAT: TOO MUCH OR TOO LITTLE

The biggest problem with health maintenance comes from inactivity or a sedentary lifestyle. Aerobic activities have been shown to decrease body fat. Sedentary lifestyles combined with poor nutritional habits have increased body fat percentages beyond a healthy standard. The American College of Sports Medicine states that adult males in excess of 20% body fat and adult females in excess of 27% body fat may need reduction of body fat to reduce the risk of health problems, especially coronary heart disease and diabetes. While too much fat (obesity) causes these diseases, too little body fat (anorexia nervosa) can result in loss of bone and muscle mass, coronary heart disease, and kidney damage. Fat is necessary to provide long term energy, to carry fat-soluble vitamins, to protect internal organs, and to maintain body temperature.

VOCABULARY

Aerobic exercise - fitness training that lasts a minimum of 20 consecutive minutes with increased heart rate in the Target Heart Rate zone.

Anaerobic exercise - fitness training that incorporates activities which: 1) require a short term demand for energy, or 2) push the body to a level where the muscular demand for oxygen is greater than the circulatory system's ability to deliver.

Carbohydrates - one of six components of nutrition, carbohydrates come from sugar and starches and are recommended to contribute 58% or more of a person's caloric intake.

Cool down - the third and final stage of a workout where the heart rate returns to resting, and stretching is used to prevent cramping from strenuous exercise.

Fat - one of the six components of nutrition used by the body as stored energy; there are 9 calories per gram, and less than 30% of caloric intake should come from fat.

Fit Formula -the amount of exercise you are getting in your fitness program. **F** stands for frequency-how often you exercise. **I** stands for intensity-how hard you work. **T** stands for time-duration of how long you work out. The time of day is not important, but rather the commitment to a minimum of three times per week, at 60-85% of THR, for 20-30 minutes uninterrupted.

Heart rate - the number of times the heart beats per minute,when counting a heart rate for less than one minute, always count the first beat as zero.

Hypokinetic disease - a health disorder caused by lack of movement.

Non-aerobic activities - movement or sport that improves general muscular strength, endurance, and/or flexibility without elevating the heart rate to the target zone.

Obesity - extreme over-fatness.

Overload principle - a systematic increase in workload which forces the body to adapt to change and increases the current fitness level.

Protein - one of six components of nutrition, used to build and repair body tissue and to regulate chemical functions of the body; 12-15% of caloric intake should come from protein.

Pulse - the movement of blood with each beat of your heart. Easiest to take at carotid artery next to the throat, or the radial artery in the wrist.

Recovery rate - the speed at which the heart rate returns to normal after exercise; as fitness level improves it takes less time to recover.

Target Heart Rate Zone - 60-85% of an individual's Maximum Heart Rate (MHR) that must be maintained for a consecutive number of minutes (not less than 20) in order to maximize oxygen use. THR zone is determined by the use of the scientific standard of 220, age, and the resting heart rate (RHR).

Threshold (aerobic) - the lowest increase in activity needed to begin getting benefits from exercise.

Warm-up - the first stage of a workout beginning with aerobic activity to warm the body and continuing with stretching the muscles to allow the joints full range of movement (flexibility).

Weight training - referred to as strength and/or resistance training, using free weights or weight machines to increase muscle strength and/or endurance.

Wellness - a holistic result of a commitment to fitness, a state of mental, emotional, social, spiritual, and physical harmony; operating easily and naturally with optimum performance.

PHYSICAL FITNESS STUDY GUIDE

Wellness comes from a commitment to a lifestyle of managing stress, eating healthy, and exercising regularly. **Physical Fitness** is one component of wellness. Physical fitness is the ability to perform normal daily tasks, with a reserve of energy left over. Improved fitness requires an exercise program including **cardiovascular endurance, flexibility, muscular endurance, and muscular strength**. People who exercise regularly are stronger, more flexible, recover from hard work or illness more quickly, live longer, and more importantly, have a better quality of life. A fit person looks good, feels good, enjoys physical activity, and effectively deals with the stress of daily life. A commitment to fitness has been shown:

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