

Study Guide

Washington Classroom-Based Assessment (CBA)

A Component of the Washington State Assessment Program

The changes to the content for Physical Education courses and in the handling of Physical Education waivers by the Seattle Public Schools coincides with changes to Washington State laws and regulations that went into effect in the 2008-2009 school year. The relevant Washington Administrative Code sections are clear when they say that even when students are excused from the performance component of physical education (athletic or academic waivers); the content knowledge requirement must be met by course work in fitness education.

(RCW 28A.230, WAC 392-410-136)

This study guide contains information from many sources which will help you when you take this multiple choice, short answers, extended response OSPI developed Fitness assessment. The assessment should take you less than an hour. Each high school is responsible for facilitating administration each school year.

Much like the requirement for Senior Projects, the completion of this assessment must be included on a student's transcript for graduation.

If you need further information, please feel free to contact:

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Five for Life

Resistance training to develop muscular strength and muscular endurance also helps improve physical appearance by controlling body composition. As resistance training increases muscle mass, a part of fat-free mass, fat mass decreases. Because muscles use calories to work, the more muscle mass a person has, the more calories that will be used. Using more calories reduces the number of calories stored as fat mass. Therefore, building muscular strength and muscular endurance is a lifelong habit needed to maintain or improve physical appearance.

Flexibility is the muscles' ability to move a joint through a full range of motion and staying flexible is important to health and performance. As the body ages, the muscles, tendons and ligaments stiffen, lose elasticity and become less flexible. As a result, a person's ability to perform movements may be hindered and he/she may be at an increased risk of injury. Improving flexibility decreases a person's risk of injury, prevents post-exercise pain and helps relieve emotional tension.

Daily activities such as combing hair, tying shoes and participating in athletics require flexibility. Golfers need flexibility in the hips and shoulders to allow them to rotate the golf club farther and in turn hit the ball a greater distance. Softball and baseball players need flexibility in their shoulders and arms so that they can bring the ball back farther, which allows them to throw the ball harder.

Flexibility is required for everyday movements, from tying shoes to throwing a ball. If a person does not perform activities that improve flexibility, then one day he/she may not be able to perform those activities. Therefore, activities to improve flexibility should be performed daily.

Dynamic and static stretches are safe and effective methods to improve flexibility. Dynamic stretches involve moving parts of the body continuously while gradually increasing reach, speed of movement or both gently throughout a full range of motion. Static stretches involve stretching a muscle to the point of mild discomfort for an extended period. These stretches can be performed as part of the warm-up and/or cool down phases of a fitness program or as a separate flexibility program.

Body Composition is the combination of fat mass and fat-free mass, including fat, bones, muscles, organs, and water. Healthy levels of fat mass are essential for insulation, the protection of organs, the absorption of vitamins, nerve conduction and as an energy source. Having too much or too little fat mass can become a health risk, lower performance and detract from appearance. Therefore, body composition is usually referred to as a percentage of body fat.

A healthy level of fat mass for men is between 10% and 20% of total body weight and a healthy level of fat mass for women is between 15% and 25% of total body weight. Improving and maintaining body composition at healthy levels will reduce the risk of heart disease, Type 2 diabetes, high blood pressure, strokes, certain types of cancer and obesity.

The percentage of fat a person has is affected by two factors; the number of calories consumed (energy in) and the amount of activity performed, and calories used (energy out). Both factors are controllable. A combined effort of eating a healthy diet (energy in) and increasing physical activity (energy out) is the best approach to maintaining a healthy level of body fat and improving overall body composition.

The benefit of understanding cardiorespiratory endurance, muscular strength, muscular endurance, flexibility and body composition, known as the Five Components of Fitness, is immeasurable and is important for improving health, performance and appearance for a lifetime.

Training Principles

When developing and implementing a personal fitness plan, it is important to understand the training principles: overload, progression, and specificity. Understanding the training principles and how to apply those principles increases a person's ability to develop a fitness plan to meet personal goals toward improved health, performance and appearance. It also increases their ability to adjust those plans as necessary. A well thought out training program uses the FITT Principle to produce overload and includes progression and specificity.

The training principles are used to help individuals achieve exercise goals in many different careers. Since the beginning of athletic competition, the principles of training have been used to improve performance. Strength coaches use them to design workout programs for top athletes. Two-tenths of a second in the 100-meter dash or two inches in the high jump might be the difference between being a good college athlete and an Olympian. One Olympic athlete reported that he trained for eight years to take 1.5 seconds off his 200-meter time. That improvement in time was the difference between being a good high school sprinter and an Olympic champion with a world record. Personal trainers use the training principles to help movie stars lose weight or bulk up as they prepare for roles in upcoming movies. Firefighters and police officers use these principles to maintain their fitness in order to perform their jobs.

For positive changes to occur in health, performance and appearance, the body must adapt to an increased demand in one of three variables of the FITT Principle. These variables are frequency (sessions per week), intensity (training load expressed as resistance, speed or heart rate) and time (minutes or repetitions). Increasing the frequency, intensity or time (FITT Principle) of an activity beyond normal performance provides a reason for the body to adapt or change to meet the new demand and make positive changes in health, performance and appearance. Training the body beyond normal performance demonstrates the principle of overload.

For example, to improve cardiorespiratory endurance, a person who runs a ten-minute mile three times a week could create overload by changing the frequency of his/her workouts from three to four times per week, increasing the intensity by running at a faster pace than a ten-minute mile, or increasing the time by running at the same pace but for a longer distance. Each of these changes would create an overload by placing a demand on the body beyond normal performance.

With overload, the body adapts slowly and makes small changes towards improvement over time. Therefore, it is important to use the principle of progression correctly. It would be unreasonable to expect the person who ran a ten-minute mile three times a week, to increase all three FITT variables at once. Because the body requires periods of rest to rebuild muscle tissue, running eight-minute miles five days a week would be difficult. The drastic difference in overload could lead to exhaustion or injury, causing the body to break down rather than adapt, thus preventing progression. To achieve desired results, the principle of progression, or gradual increasing.

Key vocabulary words that will be introduced during this unit are:

FITT Principle -The variables of frequency, intensity, time and type

Frequency - Number of exercise sessions per week

Intensity - Training load expressed as weight, speed or heart rate

Overload - An increase in one or more of the FITT variables to provide an additional workload

Progression - Gradual increase in one or more of the FITT variables to create an overload

Specificity - Exercise training is specific to the muscles used and the component of fitness trained

Time - Minutes or repetitions

Type - Activity performed

The Principle of Overload

The exercise science principle of overload states that a greater than normal stress or load on the body is required for training adaptation to take place. What this means is that in order to improve our fitness, strength or endurance, we need to increase the workload accordingly.

For a muscle (including the heart) to increase strength, it must be gradually stressed by working against a load greater than it is used to. To increase endurance, muscles must work for a longer period than they are used to or at a higher intensity.

The Principle of Specificity

The Specificity Principle simply states that exercising a certain body part or component of the body primarily develops that part. The Principle of Specificity implies that to become better at an exercise or skill, you must perform that exercise or skill. A runner should train by running, a swimmer by swimming, and a cyclist by cycling. While it's helpful to have a good base of fitness and to do general conditioning routines, if you want to be better at your sport, you need to train specifically for that sport.

The Principle of Rest and Recovery

Each muscle requires adequate time to rest and recover between workouts.

The actual duration of the rest and recovery period may vary from individual-to-individual based on factors like their current physical condition, prior weight training experience, diet, and the intensity and volume of their training.

A good rule of thumb is to provide 48 hours of rest and recovery time before working the same muscle again.

Short Answer Questions

The following are examples of situations which require short answers.

Progression

Karla knows that to get better she needs to increase the intensity of her swimming workouts. She started out swimming half a mile in the pool three times/week. Worried that she was not going to make gains fast enough she increased both her intensity (distance: 1.5 miles) and her frequency (five times/week) the second week of training. By the end of the second week Karla could barely finish the first half mile of the workout.

What mistake did Karla make?

What training principle does this relate to?

Overload

Jamie has been running a mile three times a week for the past 6 weeks. She runs about an 8 minute mile each time. At first it was really challenging and it gradually got easier. Now it's a breeze.

What should Jamie do now?

What training principle does this relate to?

Specificity

Danny works out three times a week at the gym. His program includes upper and lower body core lifts. He also runs on the treadmill for 20 minutes prior to his lifting program. When the gym offered a free fitness evaluation Danny found out that he did not meet the healthy standard for flexibility. He was confused and frustrated. He thought that with all the work he does he would at least meet standard in every area.

What was missing in Danny's program?

What training principle does this relate to?

Heart Health Pyramid

Heart rate monitors provide instant information about the intensity level at which a person is working. The heart health pyramid is used along with heart rate monitors to help check levels of intensity so that the maximum health benefits are received from a workout. Too often, people begin an exercise program and start working at a pace which is too difficult. The workout becomes so uncomfortable they are forced to stop. The next day they feel discouraged and stop exercising altogether. Slowly these people become overweight, weak and even more discouraged. This inactivity leads to health problems such as heart disease, strokes, type II diabetes, high blood pressure, obesity and osteoporosis. Physical performance also declines with inactivity as muscles become weaker and tasks which were once simple become difficult. Self-confidence and appearance begin to suffer as those people become more inactive and begin to put on unwanted weight. People are born healthy and are designed to enjoy a life complete with activity. Everyone benefits from cardiorespiratory endurance training, and good health should not be reserved just for athletic individuals. To achieve the best results from cardiorespiratory endurance training, it is important to know the correct intensity level for each person.

Using heart rate monitors, small computers that gather information about heart rate, and the heart health pyramid, a system to manage a workout using heart rate information, takes the guess work out of training. The heart does not lie; it responds directly to the amount of stress that is placed on the body. Every person needs to work at his/her own pace when working on cardiorespiratory endurance. It is possible for one person to have a higher heart rate when walking a mile at a 14-minute pace than another person who is running at an 8-minute pace. This indicates that the person walking is working harder than the person who is running. The person running might be a natural runner and not trying very hard, while the walker is doing his/her very best to finish in 14 minutes. Wearing heart rate monitors permits a person to accurately adjust a workout to meet individual needs.

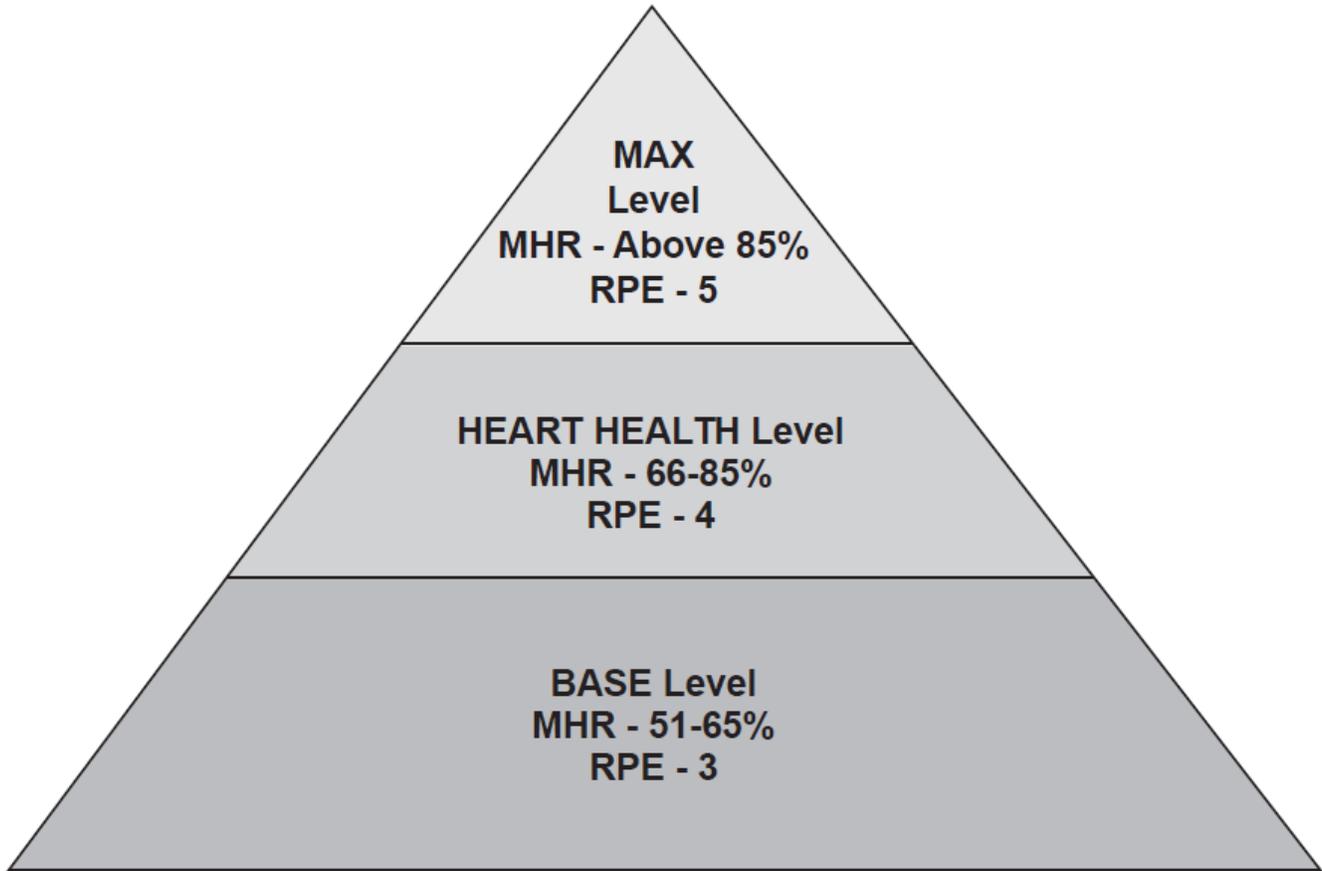
The heart responds quickly to cardiorespiratory endurance training; likewise, it responds quickly to inactivity. It takes only a few days of training to see improvements and only a few days of inactivity to lose those improvements. That is why it has been said "seven days without activity will make one weak." Research has shown that to apply the FITT principle to cardiorespiratory endurance training, the frequency should be at least 5 times per week. The intensity level of the activity should increase the heart rate to 66-85% of the maximum heart rate. The time spent in that zone should be at least 10 minutes and beyond for a total of 60 minutes a day. Following these recommendations will lead to improvements in cardiorespiratory endurance.

Key vocabulary words that will be introduced during this unit are:

- **Base Level** - 51-65% of the maximum heart rate
- **Cardiorespiratory Endurance Training** - Activities which increase the heart rate to 66-85% of the maximum heart rate and remain there for periods exceeding 10 minutes for a total of 60 minutes a day
- **Heart Health Level** - 66-85% of the maximum heart rate
- **Heart Health Pyramid** - A system to manage a workout using heart rate information
- **Heart Rate Monitor** - A small computer that gathers information about heart rate
- **Maximum Heart Rate** - Highest number of times the heart can beat in one minute
- **Max Level** - 86-100% of the maximum heart rate

The Heart Health Pyramid is based on Maximum Heart Rate. The maximum heart rate is the highest number of times the heart can beat in one minute. A common way to figure out an average maximum heart rate without doing a complicated test is the age-adjusted formula of $220 - \text{age} = \text{Maximum Heart Rate (MHR)}$.

Heart Health Pyramid



RICE

RICE is a treatment method for soft tissue injury which is an acronym for **Rest, Ice, Compression and Elevation**. When used appropriately, recovery time is usually shortened, and discomfort minimized.

RICE is for soft tissue strains and is considered more a first-aid treatment than an end-all cure. The aim is to reduce the internal bleeding.

Primary Four Terms

Rest

Rest is a key part of repair. Without rest, continual strain is placed on the area, leading to increased inflammation, pain, and possible further injury. Also, most soft tissue injuries will take far longer to heal. There is also a risk of abnormal repair or chronic inflammation resulting from a failure to rest. In general, the rest should be until the patient is able to use the limb with most of the function restored and pain essentially gone.

Ice

Ice is excellent at reducing the inflammatory response and the pain from heat generated. Proper usage of ice can reduce the destruction over-response which can result from inflammation. A good method is ice 20 minutes of each hour. Other recommendations are an alternation of ice and no-ice for 15-20 minutes each, for a 24-48-hour period. To prevent localized ischemia to the skin, it is recommended that the ice be placed within a towel before wrapping around the area.

Exceeding the recommended time for ice application may be detrimental, as blood flow will be too reduced to allow nutrient delivery and waste removal.

Compression

Compression aims to reduce the edematous swelling that results from the inflammatory process. Although some swelling is inevitable, too much swelling results in significant loss of function, excessive pain and eventual slowing of blood flow through vessel restriction.

An elastic bandage, rather than a firm plastic bandage (such as zinc-oxide tape) is required. Usage of a tight, non-elastic bandage will result in reduction of adequate blood flow, potentially causing ischemia. The fit should be snug so as to not move freely, but still allow expansion for when muscles contract and fill with blood.

Compression stockings or sleeves are a viable option to manage swelling of extremities with graduated compression (where the amount of compression decreases as the distance to the heart decreases). These garments are especially effective post-operatively and are used in virtually all hospitals to manage acute or chronic swelling, such as congestive heart failure.

Elevation

Elevation aims to reduce swelling by increasing venous return of blood to the systemic circulation. This will result in less edema which reduces pain and/or swelling.