

## **FITNESS ST. GUIDE #2 (FRESHMEN)**

### **SCHS PHYS. ED. DEPT.**

Fitness increases the heart's efficiency, resulting in a healthier body, a body that permits you to do more without tiring, a body you can be proud of. A few of the changes that occur as we get more and more fit include the following.

### **EFFICIENCY OF EXERCISE**

#### **Physiological Changes:**

- ♥ The heart becomes stronger.
- ♥ The heart's internal circulation improves.
- ♥ The resting heart rate lowers.
- ♥ The heart's stroke volume (amount of blood) and the volume per minute increases.
- ♥ The heart's contraction capacity improves.
- ♥ The muscles' capacity to use oxygen improves.
- ♥ The body's oxygen intake capacity improves.

#### **Physiological Effects of Exercise on the Human Body that May Prevent Health Problems**

- ♥ The amount of HDL cholesterol (the good cholesterol) increases.
- ♥ Secretion of adrenal hormones (stress hormones) decreases with regular exercise.
- ♥ Subcutaneous body fat decreases (person loses body fat).

#### **Other Effects**

- ♥ The level of muscular strength is preserved or improves.
- ♥ The bones become stronger
- ♥ The working capacity of joints is preserved or improves.
- ♥ Stress decreases and relaxation increases
- ♥ Self-Confidence improves.
- ♥ Social and emotional health improves.
- ♥ Exerciser feels refreshed.

Using a heart rate monitor while exercising helps us to achieve these positive benefits, starting us on the road to a healthy lifestyle.

#### **Monitoring Effort**

The best means for monitoring physical strain or effort, it to measure heart rate. The higher the heart rate, the more strenuous we can say the exercises are for a particular person. Heart rate is a useful property to measure during and after the exercise since it gives you individual feedback on your performance. Indeed, each person reacts to physical strain individually, depending on the size of the heart, fitness level, skills, and daily changes of mood. The heart rate of a fit person recovers after exercise back to the resting rate faster than that of a person in poor condition.

Measuring heart rates with a heart rate monitor encourages each student to exercise at a sufficiently strenuous level. The self-esteem of students at lower fitness levels than their peers, especially those who typically avoid exercise, increases dramatically as they take part in physical activity and achieve grades proportional to their documented efforts. In other words, using a heart rate monitor allows you to base grades on level of effort and degree of improvement, rather than on absolute achievement – very encouraging to less fit students and motivating to students at all fitness levels.

#### **Maximum and Resting Heart Rates**

Your maximum heart rate represents your heart's highest possible beating density, or your heart rate in a situation when it no longer rises even if the strain still does. Highly reputable studies have also been made of children's maximum heart rates. In a British study on students 11 to 16 years of age, the average maximum heart rates were:

- ♥ Boys 200 beats per minute (plus or minus eight beats)
- ♥ Girls 201 beats per minute (plus or minus eight beats)

In addition to maximum heart rate, another essential number is the resting heart rate, or the lowest number of beats per minute your heart contracts at rest. The best time to measure the resting heart rate is when you wake up in the morning, while still lying peacefully in bed before you lift your head from the pillow. You can most accurately define your resting heart rate, for example, by measuring the heart rate in this way for a sequence of six days, then calculating the average of those values.

### Target Heart Rate Zones

A target heart rate zone is the heart rate zone within which the heart should beat to achieve the desired physiological benefits. The most common way to calculate your target heart rate zone is by finding percentages of your maximum heart rate (HRmax). The appropriate target heart rate zone for physical exercise depends on what you are aiming for.

For the general activities of children a target heart rate zone of 60 to 80 percent of maximum heart rate has a positive effect on the heart and the circulatory system, without being too strenuous. The level of strain is aerobic, that is, the intake of oxygen by the lungs and consumption of oxygen by the lungs and consumption of oxygen by the muscles are in balance.

When exercising at the anaerobic efficiency level, the consumption of oxygen is greater than its intake, which means that the muscles will have to start using their own energy resources to maintain their work. In this way, muscles are eventually filled with waste products, especially lactic acid, which makes you feel tired and which causes muscle pain.

### Definitions & Concept Words

- ♥ **Aerobic** – Exercising at a level of strain in which a person is sweating and is no more than slightly out of breath. The metabolism of muscles is receiving enough oxygen. It is generally believed that the aerobic heart rate zone is 60 to 80 percent of maximum heart rate. This level of exercise can be sustained for long periods of time.
- ♥ **Anaerobic** – Exercising at a heavy level of strain in which a person faces fatigue quickly. The muscles have to work with insufficient oxygen supply. Typically, this exercise intensity can only be sustained for short periods (e.g. sprinting).
- ♥ **Anaerobic Threshold** – Physiological point during exercise of increasing intensity at which the blood lactate continues to accumulate such that the body is not able to synthesize it (i.e. the muscles require more oxygen than the heart via blood can transport).
- ♥ **Blood Lactate** – By-product (waste product) of the oxidation of glucose (sugar) with insufficient oxygen.
- ♥ **Capacity per Minute** – The volume of blood the heart is able to pump in one minute.
- ♥ **Heart Rate** – The number of beats of the heart normally expressed as beats per minute.
- ♥ **Maximum Heart Rate** – The highest number of times your heart can contract in one minute, which can be reached at maximum effort. Your maximum heart rate changes with age.
- ♥ **Pulse** – The measure of the heart's mechanical work in the circulatory system or the number of times the heart sends blood into the expanding arteries, normally expressed as beats per minute.
- ♥ **Recovery Heart Rate** – The heart rate measured at certain intervals after exercise, most often at one, three, and five minutes after completion.
- ♥ **Resting Heart Rate** – The number of beats in one minute when you are at complete, uninterrupted rest. It is best taken when you first wake up in the morning before you lift your head from the pillow.
- ♥ **Stroke Volume** – The amount of blood the heart is able to pump in one contraction.
- ♥ **Target Heart Rate Zones** – The heart rate range within which the heart should beat to achieve the desired physiological benefits.