

PHYS. ED. DEPT. HANDOUT # 1

FITNESS FOR LIFE

Everyone should try to achieve **TOTAL FITNESS**.

TOTAL FITNESS – fitness of the whole person, including physical, mental, social and emotional fitness.

A totally fit person is in good physical condition and is socially and emotionally mature for his or her age. Each area of total fitness depends on, and is related to, the others...physical abilities, mental attitude, patience with your body's response are all interrelated.

PHYSICAL FITNESS – is the ability of your body systems, including your muscles, skeleton and heart, to work together efficiently. Being physically fit means you are able to do the most work with the least effort.

BENEFITS OF PHYSICAL FITNESS – **Be healthy**
Feel good
Look good
Enjoy Life

Physical Fitness is made up of **HEALTH-RELATED FITNESS** and **SKILL-RELATED FITNESS**.

HEALTH-RELATED FITNESS

Cardiovascular Fitness - the ability to exercise your entire body for long periods of time; requires a strong heart, healthy lungs and clear blood vessels to supply your body with oxygen.

Strength – the amount of force your muscles can produce.

Muscular Endurance – the ability to use your muscles many times without tiring.

Flexibility – the ability to use your joints fully – through a wide range of motion.

Body Fatness – the percentage of body weight that is fat when compared to other tissue (bone, muscles, etc.).

SKILL RELATED FITNESS

Agility – the ability to change body position quickly while under control.

Balance – the ability to keep an upright posture while standing still or moving.

Coordination – the ability to use your senses together with your body parts – or use two or more body parts together.

Power – the ability to use strength quickly.

Reaction Time – the amount of time it takes you to move once you realize the need to act.

Speed – the ability to perform a movement or cover a distance in a short period of time.

MUSCULAR SYSTEM (2)

Principles of Strength Exercising

Overload – a muscle must contract harder than normal if it is to become stronger; a muscle must work more than normal.

Progression – overload gradually, increase the load over a period of time to get the best muscle strength.

Specificity – exercise the specific muscles you want to develop. Leg exercises develop the legs, arm exercises develop the arm, etc.

The F. I. T. FORMULA

FREQUENCY – refers to how often you exercise. For exercise to be of a benefit, you need to exercise at least three times a week.

INTENSITY – refers to how hard you exercise. Exercising too easily will not improve your fitness and exercising too hard can make you sore and increase the risk of injury.

TIME – refers to how long you exercise. You need to exercise 20 to 30 minutes at one time to improve your fitness.

IMPROVING MUSCLE STRENGTH

You must exert muscular force against a resistance to improve muscle strength.

ISOTONIC EXERCISES are those in which muscles contract and body parts move – such as lifting weights or doing calisthenics.

ISOMETRIC EXERCISES are those in which the muscle contracts when working against stationary object. The muscles work, but the body parts do not move. Isometric muscles are often recommended after an extended period of inactivity, such as a broken limb.

MUSCULAR ENDURANCE – is the ability of a muscle to work for long periods of time without getting tired. Muscular endurance depends on the kind of muscle fibers that make up the muscles. There are 2 kinds of muscle fibers: The first are **SLOW-TWITCH FIBERS**. These contract at a slow rate. Slow-twitch fibers 1) use oxygen from the blood to release energy 2) do not tire easily 3) have the most endurance of all muscles. **FAST-TWITCH FIBERS** contract at a fast rate. Fast-twitch fibers 1) do not use oxygen from the blood to release energy 2) have greater strength and 3) have less endurance. The relative number of the kind of fibers in a given muscle does not change, but the kind of exercise you do influences the size of the fibers and their ability to use oxygen.

LOW INTENSITY EXERCISES - build the muscular endurance needed for daily activities – use only the body parts you use daily (in other words, do nothing).

MEDIUM INTENSITY EXERCISES - build the muscular endurance needed for good fitness. Do exercises and body weight calisthenics (pull-ups, push-ups, etc.).

HIGH INTENSITY EXERCISES - build muscular endurance for high-level performance. Combine strength training with increased repetitions for endurance.

Phys. Ed. Dept. Handout #4, Ninth Grade

Define the following terms:

CARDIOVASCULAR FITNESS – fitness for the heart, lungs, blood and blood vessels.

“CARDIO” – is from the Greek word for heart.

“VASCULAR” – refers to blood vessels.

CARDIOVASCULAR SYSTEM – the body system that moves oxygen and nutrients to the body cells and removes cell waste (such as carbon dioxide).

THE HEART – 1) the heart is a muscle.

2) the heart pumps blood throughout the body.

THE LUNGS – where the blood picks up oxygen.

ARTERIES – “pipelines” that carries the blood from your heart to other parts of your body.

VEINS – 1) carry blood filled with waste products from your body back towards your heart.

2) muscles squeeze the veins to pump the blood back to the heart.

ATHEROSCLEROSIS – a disease in which arteries become clogged with fatty deposits that harden.

SATURATED FATS – a fatty substance in dairy products and visible fat in red meat.

CHOLESTEROL – a fatty substance found in meat, dairy products and visible fat in red meat.

UNSATURATED FATS – found in many oils such as olive oil, peanut oil, corn oil, and sunflower oil.

AEROBIC EXERCISE – exercise that is steady – the heart can provide all the oxygen your muscles need. Examples: 1) Jogging 2) Swimming 3) Bicycling

ANAEROBIC EXERCISE – exercise done in bursts; the heart cannot provide enough oxygen for your muscles to function

Examples: 1) sprinting

2) basketball

3) racquetball

ATHEROSCLEROSIS

It is estimated that nearly half of all deaths in the United States are due to the arterial disease called atherosclerosis. In this condition, fatty materials, particularly cholesterol, accumulate on the inner walls of certain arteries. Such deposits are called plaque, and as they develop, they protrude into the blood vessels and interfere with blood flow. Furthermore, plaque creates a surface that initiates blood clot formation. As a result, persons with atherosclerosis may develop blood deficiencies or tissue death downstream from the obstructions.

The walls of affected arteries tend to undergo degenerative changes in which they lose their elasticity and become hardened. This stage of the disease is called atherosclerosis, and when it occurs, there is a danger that a blood vessel will rupture under the force of blood pressure.

Atherosclerosis is often associated with diets containing excessive amounts of saturated fats, elevated blood pressure, tobacco smoking, obesity, and lack of physical exercise. Genetic factors may also increase susceptibility to the development of atherosclerosis.

CARDIOVASCULAR SYSTEM

The cardiovascular system, made up principally of the heart and blood vessels, moves oxygen and nutrients to body cells and removes cell wastes. The more physically active you are, the less likely you are to suffer from heart disease. Because your heart is a muscle, it benefits from exercise, particularly endurance type activities such as jogging and swimming.

F.I.T. FORMULA

The F.I.T. formula provides guidelines for exercise:

Frequency – How often you should exercise.

Intensity – How hard you should exercise.

Time – How long you should exercise.

DIET AND NUTRITION

All foods are composed of 6 different “building blocks” known as nutrients:

1. WATER
2. VITAMINS
3. MINERALS
4. CARBOHYDRATES
5. FATS
6. PROTEIN

Basic food groups:

1. MEAT group (2 servings per day)
2. MILK group (teenagers – 4 servings per day, adults – 2)
3. BREAD-CEREAL group (4 servings per day)

MUSCULAR SYSTEM

There are 3 types of muscle within the body:

1. **SKELETAL MUSCLE** – attaches to the bones and makes movement possible
2. **SMOOTH MUSCLE** – walls of hollow internal organs
3. **CARDIAC MUSCLE** - found only in the heart

Muscle functions:

1. Movement
2. Resist movement
3. Movement of body fluids
4. Heat production

SKELETAL SYSTEM

There are, in mature adult, 206 bones in the human body.

The skeletal system has 3 primary functions:

1. Provide shape
2. Provide support
3. Provide protection

CONNECTIVE TISSUE

Ligaments – Connects 2 or more bones together at a joint.

Tendons – connects bone to muscle (or muscle to muscle).

Cartilage – generally, serves as a shock absorber between bones.

Phys. Ed. Dept. Handout #6

Diet and Nutrition

Simply put, eating *improperly* can keep you from being healthy and from performing your best physically. Food is more than just something to keep you from being hungry. Food provides you with the energy and nutrients that your body needs in order to function.

All foods are composed of 6 different "building blocks" known as nutrients:

1) WATER – water is the most critical nutrient. A person can survive longer without food than without water. The human body is approximately 60% water. Each body cell contains water, which provides the environment for chemical reactions. Water is also used to transport nutrients to the cells and to carry waste products away from them. Another important function of water is to regulate body temperature. Under normal conditions 6-8 glasses of water or other fluids are needed each day to maintain fluid balance. Other liquids, fruits or vegetables can also help meet daily fluid balance.

2) VITAMINS – vitamins regulate all chemical reactions in the body. They are used in important processes such as growth and release of energy. Scientists have currently discovered 13 vitamins. Each vitamin was given a letter name in order of its discovery. A chemical or scientific name can also be used to identify a vitamin. For example vitamin C may be identified as ascorbic acid. Vitamins have been divided into two categories. There are 9 vitamins that dissolve in water which are called water-soluble vitamins. You need to replace water-soluble vitamins daily since your body stores them only in small amounts. In fact, excess amounts of water-soluble vitamins are eliminated from your body. There are also 4 vitamins that are fat-soluble – that is, they dissolve in fat rather than water. Any excess of fat-soluble vitamins are stored in the liver and in the fatty tissues of the body. The main sources of fat-soluble vitamins (A, D, E, K) are red meats, dairy products, and oils.

3) MINERALS – are also important for building and regulation the body process. Some minerals, such as calcium, phosphorus and magnesium are needed in relatively large amounts. Other minerals, such as iodine, zinc, and iron are known as "trace" minerals since they are needed only in small amounts. A well-balanced diet should provide you with all the necessary minerals your body needs.

4) CARBOHYDRATES – carbohydrates are the body's main energy source. Nutrients that provide energy contain calories. The 3 types of carbohydrates found in food are sugar, starches, and fiber.

5) FATS – another of the body's fuel sources is fat. Fat is the concentrated energy source, supplying 9 calories per gram – as opposed to the 4 calories per gram with carbohydrates. However, fat is used less efficiently since it usually takes 20-30 minutes of exercise before fat can be utilized for energy – as opposed to carbohydrates being used immediately after digestion. Fats are generally placed in two categories saturated fats, which are solid at room temperature and generally come from meats, poultry, dairy products and egg yolks. The other, unsaturated fats, are liquid at room temperature and come from vegetable sources.

6) PROTEIN – the primary purposes of protein are for growth and repair of the tissues and for regulation of body process. Protein molecules are composed of building blocks known as amino acids, some of which come only from the foods you eat.

SKELETAL SYSTEM (1)

FUNCTION – Bones provide shape, support, and protection for body structures. Bones and muscles function together to create body movement. Bones contain tissue that produces blood cells.

SHAPE – Each bone has a shape related to its functions:

Projections provide places for the attachment of muscles, tendons, ligaments.

Openings serve as passageways for blood vessels and nerves.

Ends of bones are modified to form joints with other bones.

CONNECTIVE TISSUE

LIGAMENTS – connects 2 or more bones together at a joint.

TENDONS – connects bones to muscle (or muscle to muscle).

CARTILAGE – hyaline – helps develop bones

elastic – provides a framework (external ear)

fibro – serves as a shock absorber between bones.

JOINTS

Bones are connected at joints. Joints are classified on the amount of movement they make possible. Fibrous joints provide little or no movement. Synovial joints include a membrane that secretes a fluid that absorbs the heat of friction during movement.

Ball and Socket Joint (shoulder)

Hinge Joint (elbow)

Saddle Joint (thumb)

Ellipsoid Joint (wrist)

Pivot Joint (neck)

Gliding Joint (wrist to hand)

OSTEOPOROSIS - A disorder of the skeletal system in which there is an excessive loss of bone volume and mineral content. The affected bones develop spaces and canals that become enlarged and filled with fatty tissue. Such bones are easily fractured and may break if stressed. Among factors that cause OSTEOPOROSIS is a low intake of calcium and a **lack of physical exercise**.

ARTHRITIS – A condition that causes inflamed, swollen, and painful joints.

FRACTURE – A fracture is a break in a bone.

Your Respiratory System & How Your Lungs Work

Respiration is defined as the entire process of exchange gases, oxygen and carbon dioxide, between the atmosphere and the body cells. **Lungs provide oxygen to your blood and remove carbon dioxide from it.** They are located within your chest and are protected on the sides, back and front by your ribs and the cartilage and muscle between them. Your diaphragm separates your chest cavity from your abdomen. Your heart is between your lungs, located over one corner of the left lung.

Soft and spongy, healthy lungs are a mottled pinkish gray color. **Your right lung is divided into the 3 sections (lobes), while your left lung has 2.** When you inhale, air enters through your mouth and nose, travels through the back of your throat (pharynx), through your voice box (larynx), and down your windpipe (trachea). Like an upside-down tree, the trachea branches into 2 main tubes, then each tube branches into smaller passageways (bronchi), which continue dividing and eventually form much smaller passageways (bronchioles). The smallest bronchioles end in tiny air sacs called alveoli, where the oxygen in the air you just inhaled transfers to your blood located in capillaries lining the alveoli. At the same time, the carbon dioxide in the capillaries is released. This is called gas exchange.

Your heart is located next to your lungs for a very good reason - teamwork! After oxygen is released into your blood, the blood is pumped through pulmonary vessels and veins back to the heart. **Oxygen-rich blood is then pumped out of the heart to deliver oxygen to the cells in your body and remove carbon dioxide.** Your heart then pumps the blood back to your heart's right ventricle (bottom right chamber) through the pulmonary artery to your lungs. Similar to the airways, the pulmonary arteries form smaller and smaller vessels down to the capillaries, which are so tiny that the blood cells pass through single file.

PHYS. ED. DEPT. HANDOUT # 12 YEAR END REVIEW SHEET

FITNESS FOR LIFE

The three common injuries are: 1. Strains and sprains
2. Muscle spasms (cramps)
3. Muscle bruises

CARE OF INJURIES

The accepted methods of treatment for most athletic injuries are: Ice
Compression
Elevation
Rest

PRECAUTIONS

Warm up and stretch
Start Slowly
Exercise correctly

EXERCISE

A good safe exercise program includes three stages: a warm-up
a workout
a cool-down

Your heart is also a muscle and needs to be warmed up. Generally, a heart warm-up consists of walking or jogging. Your goal should be to gradually increase your heart rate and raise your muscle temperature. Your muscle warm-up should include gentle stretching exercises.

FITNESS

Among the benefits of physical fitness are to:

**be healthy
feel good
look good
enjoy life**

Physical fitness is made up of:

**health related fitness
Skill related fitness**

Health Related fitness includes:

**CARDIOVASCULAR FITNESS
STRENGTH
MUSCULAR ENDURANCE
FLEXIBILITY
BODY FATNESS**

Skill Related fitness includes:

**AGILITY
BALANCE
COORDINATION
POWER
REACTION TIME
SPEED**

FITNESS FOR LIFE

COMMON INJURIES

1. Sprains and strains
2. Muscle spasms
3. Muscle bruises

CARE OF INJURIES

ICER – (Method of treatment)

Ice
Compression
Elevation
Rest

PRECAUTIONS

Be fit
Warm up and stretch
Start slowly
Use moderation
Exercise correctly

EXERCISE & WEATHER - Guidelines

Begin gradually
Drink water
Wear proper clothing
Rest frequently
Avoid extreme conditions

EXERCISE & SAFETY

Air pollution
Altitude
Proper equipment
Proper breathing

HARMFULEXERCISES - Examples

Double leg lift / Straight leg sit-up
Bicycle stand
Back arches
Deep-knee bend

MUSCULAR SYSTEM

Names of muscles may indicate a muscle's relative size, shape, location or action – as well as other functions or descriptions.

<u>MUSCLE</u>	<u>LOCATION</u>	<u>ACTION</u>
Masseter	Jaw	Closes the jaw
Sternocleidomastoid	Neck	Head movement
Pectoralis Major	Chest	Arm movement
Deltoid	Shoulder	Upper Arm movement
Trapezius	Back (Upper)	Scapula movement
Latissimus Dorsi	Back (Lateral)	Arm movement
Biceps Brachii	Arm (Upper-Front)	Arm-Hand movement
Triceps Brachii	Arm (Upper-Rear)	Extends Arm
Brachio Radialis	Forearm	Flexes Arm
Rectus Abdominus	Abdominal (Upper)	Compresses and tenses abdominal wall & contents
External Oblique	Side	Extends leg
Gluteus Maximus	Buttock	Thigh, leg movement
Sartorius	Hip to knee	Extends leg
Quadriceps Femoris	Frontal Thigh group	Flexes & Rotates leg
Biceps Femoris group	Upper rear leg	Foot flexion
Soleus	Lower frontal leg	

TERMINOLOGY RELATING TO MOVEMENT OR LOCATION

ABDUCTION – movement of a body part away from the midline.

ADDUCTION – movement of a body part toward the midline.

ANTERIOR – pertaining to the front (opposite of posterior).

BRACHIAL – pertaining to the arm.

CERVICAL – pertaining to the neck.

EXTENSION – movement that increases the angle at a joint.

FLEXION – movement that decreases the angle at a joint.

GLUTEAL – pertaining to the buttocks.

INSERTION – the end of a muscle attached to a moveable part.

LATERAL – pertaining to the side.

MEDIAL – toward or near the middle.

ORIGIN – the end of a muscle attached to a relatively immovable part.

PECTORAL – pertaining to the chest.

PERIPHERAL – pertaining to the outside or the surface.

POSTERIOR – toward the back (opposite of anterior).

PRONATE – palm of the hand moves downward or backward.

SUPINATION – rotate forearm so palm faces upward.

THORACIC – pertaining to the chest.

VISCERAL – pertaining to the contents of a body cavity.