UNITED STATES MARINE CORPS
Marine Corps University
Corporals Noncommisioned Officers Program

CPL 0101
Jan 99

LESSON PLAN

Physical Fitness Training

INTRODUCTION (5 MIN)

1. GAIN ATTENTION: A Marine's level of physical fitness has a direct impact on his combat readiness. The many battles in which Marine's have fought underscore the important role physical fitness plays on the battlefield. A sound unit physical fitness program matched up with a leader who has the capabilities to conduct tough and vigorous physical training can not only enhance the unit but enhance the individual Marine's quality of life, improve productivity, and bring about positive physical and mental changes. Not only are physically fit Marines essential to the Marine Corps, they are also more likely to have enjoyable, productive lives.

2. OVERVIEW: During this period of instruction, we will cover the basic types of fitness programs, physical and individual factors and how they affect performance, coupled with the steps in developing and conducting a physical readiness training program. This class pertains to all physical fitness training sessions.

3. INTRODUCE LEARNING OBJECTIVES:

INSTRUCTOR NOTE: MAKE THE STUDENTS AWARE OF THE LEARNING OBJECTIVES.

a. TERMINAL LEARNING OBJECTIVE: Given a group of Marines in appropriate PT gear, a training site, and with the aid of references, lead a unit in physical fitness training per the references. (CPL 23.1)

b. ENABLING LEARNING OBJECTIVES (CE): Given a scenario on physical fitness and without the aid of but per the references, identify the following:

(1) Marine Corps Order on physical fitness. (CPL 23.1a)
(2) Benefits of physical fitness training. (CPL 23.1b)
(3) Principles of exercise. (CPL 23.1c)
(4) Components of physical fitness. (CPL 23.1e)
(5) Types of physical fitness programs. (CPL 23.1e)
(6) FITT factors. (CPL 23.1f)
(7) Elements of the physical training period. (CPL 23.1g)
(8) How the environmental considerations apply to fitness. (CPL 23.1h)

(9) Physiological differences between the sexes. (CPL 23.1i)
(10) How age affects physical activity. (CPL 23.1j)
(11) Nutrition guidelines. (CPL 23.1k)

4. METHOD: This lesson will be taught by the lecture method. Media will be developed at each academic site. .

INSTRUCTOR NOTE: EXPLAIN ABOUT THE INSTRUCTOR RATING FORMS (IRF's).

5. EVALUATION: Students will be evaluated by a written evaluation.

TRANSITION: Are there any questions on the learning objectives, how this lesson will be taught, or when you will be evaluated? If not, let's start by discussing the Marine Corps Order on physical fitness.

BODY (40 MIN)

1. MARINE CORPS ORDER ON PHYSICAL FITNESS: (2 MIN)

a. It is essential to the day to day effectiveness and combat readiness of the Marine Corps that every Marine be physically fit regardless of duty assignment. Physical fitness is an indispensable aspect of leadership. The habits of self discipline required to gain and maintain a high level of physical fitness are inherent in the Marine Corps way of life and must be a part of every Marine's character.

b. The physical fitness conditioning program requires each Marine to receive a minimum of 3 hours physical fitness training per week, to be tested semiannually, and obtain a minimum standard of third class. The attainment of a higher level score is encouraged since PFT scores are figured into composite scores; however, do not overemphasize PT to the point where it is detrimental to the development of the total Marine.

c. The order that provides physical fitness requirements for the Marine Corps is MCO 6100.3, *Physical Fitness.*

TRANSITION: Now that we know the Marine Corps Order on physical fitness, let's move into a discussion of the benefits associated with being physically fit.

2. BENEFITS OF PHYSICAL FITNESS TRAINING: (3 MIN) It is essential to the day-to- day effectiveness and combat readiness of the Marine Corps that every Marine be physically fit regardless of MOS and duty assignment. Physical fitness is an indispensable aspect of leadership. The habits of self-discipline required to gain and maintain a high level of physical fitness are inherent in the Marine Corps way of life and must be a part of every Marine's character. The benefits of physical fitness are:

a. Improved Muscle Tone: Muscular strength and endurance training produces lean body mass (muscle) and reduces body fat.

b. Cardio-Respiratory Endurance: This permits continuous physical activity without a decline in performance and allows for rapid recovery following fatiguing physical activity by ensuring adequate oxygen is supplied to the working muscles to produce energy. Circulation of the blood speeds up. The efficiency and effectiveness of the heart, lungs, and blood vessels improves.

c. Improved Flexibility: This is a wider range of movement of a joint or series of joints and their associated muscles improves.

d. Improved Weight Control: A combination of exercise and diet helps your body to lose excessive body weight by burning fat stores in the body and also maximizing the fats you consume and converting them to energy for exercise. Increased body fat and body weight is not only a health risk, but is also detrimental to any strenuous physical activity.

e. Reduced Injury Susceptibility: Injuries are reduced through the strengthening of muscles, tendons, and joints. Injuries such as hernias, back and joint sprains are less likely to occur if your body is conditioned properly.

f. Decreased Tension: Working off excess nervous energy and relief from daily worries and cares helps to relieve tension.

g. Improved Sleep: Sleep improves because muscles are healthfully tired after exercise. A byproduct of sound sleep is the relief of tension.

TRANSITION: Now that your Marines know the benefits of exercise and are eager to get started, you as a PT leader must develop your PT program around the Principles of exercise.

3. PRINCIPLES OF EXERCISE: (3 MIN) Adherence to certain basic exercise principles is important for developing an effective program. The principles of exercise apply to everyone at all levels of physical training. These basic principles of exercise must be followed:

a. Regularity: Regular exercise, rest, and sleep are vital to a healthy body. There is no easy or occasional way to develop fitness. You must exercise regularly in order to achieve a training effect -- daily exercise is preferred and encouraged. Regularity is also important in resting, sleeping, and following a good diet.

b. Progression: The intensity (how hard) and the duration (how long) of exercise must gradually increase to improve the level of fitness.

c. Balance: To be effective, a program should include activities that address all of the fitness components, since overemphasizing any one of them may hurt the others. Many weight lifters can not run and many runners cannot do pull-ups.

d. Variety: Providing a variety of activities reduces boredom and increases motivation and progress. The most successful programs usually include conditioning activities, competitive events,

and military physical skill development. Commanders should emphasize unit and combat fitness training vice PFT training, and reflect this distinction in unit training plans and scheduling.

e. Specificity: Training must be geared toward specific goals. For example, if one of your goals is to improve your forced marches, then you must include forced marches in your program. It is not enough that your goal be to "get in shape." You must be more specific. A better goal would be to "get in shape by improving cardio-respiratory endurance (through running, swimming, aerobics) and muscle tone (by reducing body fat through better eating habits and weight lifting)."

f. Recovery: Marines tend to forget this vital principle of training. Your body requires 48 hours to recover from a hard day of training. This should be followed by an easier training day for that component and/or muscle group. Another way to recover is to alternate the muscle groups exercised every other day.

g. Overload: This is the basis for all exercise training. In order for your physical fitness to improve, you must exercise your body beyond its normal work load. Unless you take your body beyond the "comfort zone," by either running faster or longer distance, or putting more workload on your muscles, then your physical fitness will not improve.

TRANSITION: Physical fitness is the ability to function effectively in physical work and still have enough energy left over to handle emergencies which may arise. Every PT session that you conduct should strive to improve certain components of physical fitness.

4. COMPONENTS OF PHYSICAL FITNESS: (3 MIN) There are many ways to define physical fitness. The definition will depend on the goals to be met by each unit. This is where the principle of specificity comes into effect. We all train for the PFT, but our ultimate goal is mission readiness. Our training must focus around command taskings and accomplishing goals set fourth by unit commanders. The components of physical fitness should include:

a. Cardio-Respiratory (CR) Endurance: This is the ability of the heart, lungs, and blood vessels to deliver an adequate amount of oxygen and nutrients to the working muscles. This is considered aerobic (with oxygen) exercise.

b. Muscular Strength: The greatest amount of force a muscle or muscle group can exert in a single effort with maximum resistance applied.

c. Muscular Endurance: The ability of a muscle group to perform multiple repetitions of a given load without a decrease in performance.

d. Flexibility: The ability to move joints (i.e. knee, elbow) or any group of joints through an entire range of motion. This type of training helps to balance overused muscle groups during PT sessions.

e. Body Composition/Weight Control: The amount of body fat a Marine has in comparison to his/her total body mass.

(1) Body Fat: This is a reserve of stored energy throughout the body.

(2) Lean Body Mass: This is the rest of the body's weight, to include- muscles, organs, bones, and nervous tissue.

TRANSITION: Now that we understand the components of fitness, you can better plan the type of program your unit will need to conduct.

5. TYPES OF PHYSICAL FITNESS PROGRAMS: (3 MIN) Marine units are inherently different in organization and mission. Therefore, their physical fitness program must be tailored to the mission and the current physical condition of most unit personal. Programs shaped to meet this need are:

a. Developmental Program: Marines in a beginning or poor state of physical readiness need a program which will develop strength, endurance, physical skills, and character traits which are vital to the successful accomplishment of military missions. Such programs should be progressive and gradually rise to a peak of fitness. During this type of program, the Marines will develop sore, stiff muscles or joints. This will last approximately two weeks, depending upon the amount of effort the individual exerts during the exercise period. A slight decrease in performance is normal. This is due to Lactic acid build up in the muscle cells and the body not being able to properly dispose of it into waste. After this initial break down period, the Marines will notice a slow steady improvement of physical performance which lasts six to ten weeks. During the latter portion of this phase, improvement gradually levels off, creating a "plateau effect."

b. Maintenance Program: This program is designed to maintain an individual or unit at their present level of fitness. This is the most common type of organized PT program in the Marine Corps.

c. Leadership Development: The purpose of this program is to train small-unit leaders to conduct physical training for their unit. This type is used at the SNCOA.

d. Remedial Program: The term "remedial" is usually applied to those individuals or groups who possess substandard physical fitness levels. For example, a remedial physical conditioning program could be applied to Marines who are overweight, who fail to reach minimal physical fitness test standards, or have missed extended periods of conditioning due to illness, injury, extended hospitalization or other absences. Remedial training sessions are designed for all individuals who fail to meet adequate standards. Personnel in a light or no duty status should still try to get in some type of physical training as long as it doesn't interfere with the guidelines established by their medical chit.

TRANSITION: Now with all things considered, you are ready to start your PT program. Whatever program you intend to use in your unit there are certain factors which must be applied to ensure your unit gets the most out of their workout.

6. FITT FACTORS AND HOW THEY RELATE TO PHYSICAL FITNESS: (3 MIN) Certain factors must be a part of any fitness program for it to be successful. They are frequency, intensity, time, and type (FITT).

a. Frequency: This factor applies to how often you conduct PT. You get physically fit because your body sees a need to adapt itself to a different set of conditions, such as an increased demand on your heart or certain muscles. If this increased demand is only occasionally applied, then your body will not see a need to adapt. By order, Marines are required to participate in physical training at a minimum of 3 hours a week. This means that you will have three, one hour long, PT sessions per week. For optimal results, leaders should strive to conduct five, one hour long, PT session per week.

b. Intensity: Training at the right intensity is the biggest problem in unit programs. The intensity should vary with the type of exercise being done. Exercise for cardio-respiratory development must be strenuous enough to elevate the heart rate to between 60-90 percent of the heart rate reserve. Appendix A contains a more detailed discussion of heart rate reserve and how to determine what yours is. Those with low fitness levels should start exercising at a lower training heart rate of about 60 percent of heart rate reserve. For muscular strength and endurance, intensity refers to the percentage of the maximum resistance that is used for a given exercise.

c. Time: Like intensity, the time spent exercising depends on the type of exercise being done. At least 20 to 30 continuous minutes of intense exercise must occur in order to improve any level of fitness.

d. Type: Type refers to the kind of exercise performed.

(1) CR training requires rhythmic and continuous use of large muscle groups.

(2) Muscular training requires progressive work against resistance, to include - weights, machines, and natural body weight (sit-ups, pull-ups, and push-ups).

(3) Flexibility exercises, for safety reasons, should be static (slow, gradual, and controlled) stretching. This type of stretching is least likely to cause injury and is preferred by professionals.

TRANSITION: Considering the FITT factors and knowing what phase your Marines are in will help determine the steps needed in leading a training program. Now let's take a 5 minute break before we come back and move into the actual PT session and the things that must be accomplished during that session.

7. ELEMENTS OF THE PHYSICAL TRAINING PERIOD: (3 MIN) The workout or physical training period is the heart of the program. It is what actually accomplishes the mission.

a. Warm-up: You must prepare the body before taking part in organized PT. A warm-up may help prevent injuries and maximize performance. The warm-up increases the body's internal temperature and heart rate. The chance of getting injured decreases when the heart, muscles,

ligaments, and tendons are properly prepared for exertion. A warm-up should include some running-in-place or slow jogging, stretching, and calisthenics.

b. Exercise Period: This is the body of the workout and the key to the whole program. Keeping everything that you have learned up to this point in mind, all activities during this period should be tailored to the accomplishment of those objectives.

c. Cool-down: Marines should cool down properly after each exercise period, regardless of the type of workout. The cool-down serves to gradually slow the heart rate and helps prevent pooling of the blood in the legs and feet. During exercise, the muscles squeeze the blood through the veins. This helps return the blood to the heart. After exercise however, the muscles relax and no longer do this, and the blood can accumulate in the legs and feet. This can cause a person to faint. A good cool-down will help avoid this possibility.

(1) Hot Weather: Most heat casualties occur after vigorous exercise, not during. It's important that Marines cool down gradually, basically in the same manner they were warmed-up. Water should be consumed during the cooling down period, to aid individuals in recuperation from the heat.

(2) Cold Weather: After the exercise period, it's important that Marines do not cool down too quickly, as this can cause cold sickness. The best method is to have them put on dry sweats directly after the workout before you begin your cool down exercises as this will slow the cooling down of the body temperature substantially.

TRANSITION: Whatever type of PT program that you set out to accomplish with your unit there is certain planning and coordination that must exist to ensure that the actual workout is a smooth functioning, integrated part of the program. In order to implement a workable and effective program, you must gear your plans around certain environmental considerations.

8. ENVIRONMENTAL CONSIDERATIONS: (5 MIN) Marines may deploy anywhere in the world. They may go into the tropical heat of Central America, the deserts of the Middle East, the frozen fjords of Norway, or the rolling hills of western Europe. Each environment presents unique problems concerning a Marine's physical performance. While recognizing such problems is important, preventing them is even more important. This requires an understanding of the environmental factors which affect physical performance and how the body responds to those factors.

a. Temperature Regulation: The body constantly produces heat, especially during exercise. To maintain a constant normal temperature, it must pass this heat on to the environment. Life-threatening circumstances can develop if the body becomes too hot or cold. In the case of overheating, the body can produce heat at a rate of 10 to 20 times greater than during rest. To survive, it must get rid of the excess heat. Heat moves from warm to cool areas. An example of this is sweating, the body's most important means for heat loss. Any condition that slows or blocks the transfer of heat from the body by evaporation causes an increase in body temperature. This could result is heat related injuries, (i.e. heat cramps, heat stroke, or heat exhaustion.) To prevent heat injuries, leaders must do the following:

* Adjust the intensity to fit the temperature and humidity.
* Ensure Marines drink enough water before, during, and after exercise.
* Avoid highly concentrated liquids such as sodas and those with a high sugar content, because they slow down the absorption of water by the stomach.
* Avoid consuming hot liquids such as coffee and tea. Because they act as a diuretic, they make you urinate more frequently and this fluid loss could result dehydration.

b. Acclimatization to Hot, Humid Environments: A Marine's ability to perform effectively in hot, humid conditions depends on both his acclimatization and level of fitness. Some important changes occur as a result of acclimatization to a hot environment. The following adaptations help the body cope with a hot environment.

* Sweating occurs at a lower body temperature.
* Sweat production is increased
* Blood volume is increased.
* Heart rate is less at any given work load.

c. Exercising in Cold Environments: Contrary to popular belief, there are few real dangers of exercising in temperatures well below freezing. Since the body produces large amounts of heat during exercise, it has little trouble maintaining a normal temperature. There is no danger of freezing the lungs. However, without proper precautions, hypothermia, frostbite, and dehydration can occur. One of the most important precautions to prevent cold weather injuries is being properly dressed when conducting PT in cold weather. Clothing for cold weather should protect, insulate, and ventilate. The following are some guidelines that should be followed:

* Preserve body heat by covering as large an area of the body as possible.
* Insulation will occur by trapping air which has been warmed by the body and holding it near the skin.
* Ventilate by allowing a two-way exchange of air through the various layers of clothing.
* Clothing should leave your body slightly cool rather than hot.
* Clothing should be loose enough to allow movement.
* Clothing soaked with perspiration should be removed if reasonably possible.

d. Acclimatization to High Altitudes: Elevations below 5,000 feet have little or no effect on healthy people. However, at higher elevations the atmospheric pressure is reduced, and the body tissues get less oxygen. This means that Marines cannot work or exercise as well at high altitudes. Once the person is acclimatized, the longer a Marine remains in a high altitude, the better his performance becomes.

TRANSITION: Another important factor to consider when you develop your PT program is the differences between the sexes.

9. PHYSIOLOGICAL DIFFERENCES BETWEEN THE SEXES: (3 MIN) Marines vary in their physical makeup. Each body reacts differently to varying degrees of physical stress. No two bodies react exactly the same way. Leaders must be aware of these differences and plan the training to

provide maximum benefit for everyone. The following describe the most important physical and physiological differences between men and women:

a. Size: The average 18 year-old man is 70.2 inches tall and weighs 144.8 pounds, whereas women of the same age are 64.4 inches tall and weigh 126.6 pounds. This difference in size affects the absolute amount of physical work that can be performed by men and women.

b. Muscles: Men have 50 percent greater muscle mass, based on weight that do women. A woman who is the same size as her male counterpart is generally only 80 percent as strong. Therefore, men usually have an advantage in strength, speed, and power over women.

c. Fat: Women carry about 10 percent more body fat than do men of the same age. Also, because the center of gravity is lower in women than in men, women must overcome more resistance in activities that require movement of the lower body.

d. Heart Size and Rate: The average women's heart is 25 percent smaller than the average man's. Thus, the man's heart can pump more blood with each beat. The larger heart size contributes to the slower resting heart rate in males.

e. Flexibility: Women are generally more flexible than men.

f. Lungs: The lung capacity of men is 25 to 30 percent greater than that of women. This gives men still another advantage in the processing of oxygen and in doing aerobic work such as running.

TRANSITION: In light of these factors, females have to work harder to accomplish the same physical levels as males. Regardless of gender, a unit physical training program can be designed to meet all objectives of physical conditioning. In the interest of unit integrity, teamwork, and Esprit de Corps, this is important. Now let's talk about age and how it affects physical activity.

10. HOW AGE AFFECTS PHYSICAL ACTIVITY: (3 MIN) Marines who are older represent the senior leadership in the Marine Corps. They must lead other Marines under conditions of severe stress. Increased age usually brings increased responsibility which, in many instances, leads to a routine that can become devoid of physical activity. To meet this challenge and set a good example, these leaders must maintain and demonstrate a high level of physical fitness. Since their normal duties may be stressful but nonphysical, they must take part regularly in a physical fitness program. The need to be physically fit does not decrease with increased age. People undergo many changes as they grow older, some of these changes are:

a. Heart: The amount of blood the heart can pump per beat per minute decreases during maximum exercise, as does the maximum heart rate. This lowers a person's physical ability and performance suffers.

b. Fat: The percent of body weight composed of fat generally increases, while total muscle mass decreases. The result is muscle strength and endurance suffers.

c. Peak Fitness Levels: Men tend to maintain their peak levels of muscular strength and endurance and cardio-respiratory until age 30. After 30 there is a gradual decline throughout their lives. Women tend to reach their peak in physical capability shortly after puberty and then undergo a progressive decline.

TRANSITION: Although a decline in performance normally occurs with aging, those who stay physically active do not have the same rate of decline as those who do not. In short, regular exercise can help add life to your years and years to your life. Another important aspect to maintaining a physically fit body is the food that we put in it. A PT program is good for all Marines but without proper eating habits the goals could be short changed.

11. NUTRITION: (9 MIN) Body composition plays a big role in a persons fitness level. Good dietary habits will bring performance to the maximum potential; however, you must combine both aspects of nutrition and exercise to reap the benefits.

a. The following are some guidelines to go by when choosing the foods you eat.

* Eat a variety of foods.
* Maintain healthy body weight.
* Eat foods that are low in fat, saturated fat and cholesterol.
* Eat plenty of vegetables, fruits and grains.
* Use sugars, salt, and sodium in moderation.
* If you drink alcoholic beverages, do it moderately.

b. Types of Nutrients: There are many types of nutrients found in food. We will only cover a few of them.

(1) Protein: Protein is used to build, maintain, and repair muscle tissue, and forms an important part of enzymes, hormones, and body fluids. It helps to form antibodies that fight off infections. There are 4 calories in each gram of protein. The recommended daily allowance for protein should constitute 15 - 20% of your caloric intake. For some, depending on their fitness program and goals, the intake may be slightly higher or lower in percentage. Protein is found mostly in meats, but also is other things, such as nuts.

(2) Carbohydrates: Carbohydrates supply food energy and help to use fat efficiently. There are 4 calories in each gram of carbohydrates. Carbohydrates are found in pastas, breads, cereals, beans, and grains etc. The recommended daily allowance for carbohydrates should constitute 60 - 70% of your caloric intake. (Most Americans get only 45 - 55% of their caloric intake from carbohydrates.) This intake, again, may be slightly higher or lower depending on their fitness programs and goals. There are two types of carbohydrates that provide energy:

(a) Simple Carbohydrates: These are in the form of sugars. Sugars enter the blood faster, thus providing quick bursts of energy. They do not last long, and the tempo of the energy level dies quickly after consumption and use.

(b) Complex Carbohydrates: These are in the form of starches. Starches take longer for the body to digest, thus providing a long-term fuel source for longer endurance activities.

(3) Fats: Fat supplies food energy and essential fatty acids. They also help the body use certain other nutrients. There are 9 calories in every gram of fat. You can see that this is a significant increase of calories per gram over protein and carbohydrates. The recommended daily allowance is no more than 30% fat from your caloric intake. (Most Americans get 35 - 40% of their caloric
intake from fat. Fat comes in many varieties. There are two kinds of fat.

(a) Saturated Fat: Saturated fat is solid at room temperature and comes mainly from animal sources. Some non-animal sources are palm, coconut oils and cocoa butter.

(b) Unsaturated Fat: Unsaturated fat is usually liquid at room temperature. They are found in vegetables, fish, and poultry.

NOTE: Along with these fats is a special kind of waxy fat called sterol. This is found only in animals. A high level of cholesterol increases the risk of cardiovascular disease (clogging arteries). But, keep in mind the body manufactures it and is necessary for survival.

(4) Vitamins: Vitamins are used to regulate most body functions. They are also vital links in metabolism and help utilize proteins, carbohydrates and fats where needed. There are two types of vitamins:

(a) Water soluble: These vitamins are not stored in the body, and any extra is excreted by the body. Some of these vitamins include:

1. Vitamin C: They hold body cells together and strengthen the walls of blood vessels, heals wounds, builds resistance against infection and helps to build bones.

2. Vitamin B Complex: These help maintain the normal health of the skin, intestines, and the nervous system. They also help the cells of the body use oxygen.

(b) Fat Soluble: These vitamins are stored in the body, and if taken in excess may become toxic. Some of these vitamins include:

1. Vitamin A: This maintains healthy skin tone, helps build antibodies against infection and promotes growth.

2. Vitamin D: This is absorbed through the skin. It helps build strong bones and joints.

3. Vitamin E: This is needed to maintain healthy hair and skin, and delays the aging process.

c. Calorie Intake: Another aspect to look at is the calorie intake. A Marine must consume enough calories to meet their energy needs. Weight is maintained as long as the body is in an energy balance, (i.e. number of calories consumed equals the number of calories used). To estimate the number of calories used in daily activity, multiply your body weight by 13 if inactive, 14 if somewhat active, and 15 if moderately active. The result will provide an estimate of the number of calories needed to maintain your present body weight. This is known as an energy balance. Keep in mind a male should not get less than 1500 calories daily and a female not less than 1200 calories daily. Also, 3500 calories equals 1 pound, so in one week, to lose a pound, you must lower your caloric intake 500 calories daily.

d. Water: Water is very important in maintaining good nutritional habits. It is an essential nutrient that is critical to optimal physical performance. It's the body's cooling system when sweating occurs. Water must be consumed before, during, and after exercise to prevent poor performance and injuries. The following are some recommendations for fluid intake:

* Drink cool (about 40 degrees) water. Fluid also comes form milk, juice, soup, and other beverages.
* Do not drink coffee, tea, or soft drinks in excess even though they are fluids. The caffeine content acts as a diuretic which increases urine production and fluid loss. The caffeine also increases your heart rate.
* Drink large quantities of water one to two hours before exercise. This allows time for hydration and urination.
* Drink three to six ounces of fluid every 15 - 30 minutes during exercise.
* Replace fluid losses by monitoring your pre- and post-exercise body weights. Drink 2 cups for every pound lost.

TRANSITION: Now that we have discussed nutritional aspects of physical well being, are there any questions?

OPPORTUNITY FOR QUESTIONS (3 MIN)

1. QUESTIONS FROM THE CLASS.

2. QUESTIONS TO THE CLASS.

a. QUESTION: What are four types of physical training programs?
ANSWER: Developmental, maintenance, remedial, and leadership development.

b. QUESTION: What are the elements of the physical training period?
ANSWER: Warm-ups, exercise period, and cool-downs.

SUMMARY (2 MIN)

So far we have covered the benefits of exercise, the principles and components of physical fitness, the phases of physical conditioning, the types of physical fitness programs, the FITT factors and how they apply to fitness, the elements of the physical training period, environmental considerations,

the physiological differences between men and women, how age effects physical activity, proper nutrition as it applies to physical fitness, the immediate care for overuse injuries, military appearance, and weight control. Those students with the IRF's, fill them out and turn them in at this time. The rest of the class take a ten minute break.

INSTRUCTOR NOTE: EXPLAIN WHAT TO DO WITH THE IRF's, BREAK, AND NEXT PERIOD OF INSTRUCTION.

REFERENCES: FMFRP 0-1B, Marine Physical Readiness Training for Combat
MCO 6100.3, Physical Fitness
MCO 6100.10, Weight Control and Military Appearance

APPENDIX A

MONITORING THE HEART RATE

1. Keeping track of the heart rate lets you gauge the intensity of the cardio-respiratory exercise being conducted to ensure maximum effort is being exerted during physical training sessions. With this information, you can be sure that the intensity is enough to improve your cardio-respiratory fitness level. Remember, intensity is probably the single most important factor for improving performance.

a. Maximum Heart Rate (MHR). Determine your MHR by subtracting your age from 220.

EXAMPLE: MHR = 220 - age
MHR = 220 - 22 = 198 for a 22 year old Marine.

b. Resting Hear Rate (RHR). Next, figure your RHR. This is your heart rate when you are totally rested and relaxed. A good time to figure your RHR is in the morning as soon as you wake up. Check your pulse in your wrist or in your neck for 60 seconds. This gives you the most accurate reading.

c. Heart Rate Reserve (HRR). Next, figure your HRR. This is the heart rate that is between your Maximum Heart Rate and your Resting Heart Rate.

EXAMPLE: HRR = MHR - RHR
HRR = 198 - 68 = 130 for a 22 year old Marine with a RHR of 68.

d. Training Heart Rate (THR). The THR is the heart rate that you want to achieve during exercise. It is figured by adding 60 - 90% of your HRR to your RHR. The percent that you use will depend on what type of shape you are in.

* Poor shape = 60%
* Good shape = 70%
* Excellent shape = 85%

EXAMPLE: THR = (% x HRR) + RHR
THR = (.70 x 130) + 68 = 159 for a 22 year old Marine in good shape with a resting heart rate of 68. What this means in our example, is that this Marine should adjust the intensity of his exercise so that his heart rate is 159 beats per minute or more.

e. To check your heart rate during a work out, count your pulses in a ten second time limit and multiply by 6.

EXAMPLE: 27 (in 10 secs.) x 6 = 162 Beats Per Minute.

f. A Marine that maintains his THR throughout 20 - 30 minute exercise period is doing well and can expect improvement in his cardio-respiratory fitness level. Heart rates should be taken at approximately 5 minutes into the workout.

APPENDIX B

FORM FOR PHYSICAL TRAINING

NOTE: There is no drill movement in the drill manual on how to form for PT. There are actually several ways of doing it. This is merely one of those ways.

(P) To form for physical drill with or without arms.
(F) Platoon in column.
(W) Halted at attention. If armed with rifles, the rifles will be at order arms.
(C) The commands will be explained with each movement.

1. Before the movement is executed the unit leader will be placed 3 paces from the platoon guide and centered on the column.

2. COUNT OFF. The command is FROM FRONT TO REAR, COUNT OFF. The base for this movement is the squad leaders. The platoon guide will not count off. At the command of execution OFF, the squad leaders turn their heads to the right, smartly shouting ONE, as they turn their heads back to the front. When the Marine in front calls out a number, the next one turns his head to the right and smartly shouts the next higher number as the previous Marine turns his head back to the front.

3. TAKE INTERVAL TO THE LEFT. The next command is TAKE INTERVAL TO THE LEFT, MARCH.

a. Third Squad. The base for this movement is the third squad. On the command of execution MARCH, all members of the third squad cover in file and stand fast. They remain in this position until given another command.

b. First Squad. At the command of execution MARCH, all members of the first squad face left as in marching and take four 30 inch steps, halt, and execute a right face. They cover automatically without command. They remain in this position until given another command.

c. Second Squad. At the command of execution MARCH all members of the second squad face left as in marching and take two 30 inch steps, halt, execute a right face. They cover automatically without command. They remain in the this position until given another command.

d. Unit Leader. At the command of execution, MARCH, the unit leader faces to the right as in marching, takes the appropriate number of steps to get re-centered on the squad leaders and faces toward the platoon.

4. EVEN NUMBERS TO THE RIGHT. The next command is EVEN NUMBERS TO THE RIGHT, MOVE. At the command of execution, MOVE, all even numbered Marines in the formation and the platoon guide move to their right and to the middle of the interval between files by swinging the right leg sideways. They spring from the left foot and land on the right foot. They bring the left foot smartly against the right. They cover automatically without command.

5. REFORM THE UNIT. The command is ASSEMBLE, MARCH. At the command of execution MARCH, all odd numbered Marines of the third squad and the even number men of the second squad stand fast. All remaining members face as in marching and return on the double to their original position and stand fast. The unit leader faces to the left as in marching and re-centers himself on the column to verify that cover has been made. After verifying cover, the unit leader faces half right as in marching and moves to a position 6 paces and center on the column.

6. IF ARMED. If armed with rifles, all marching movements are executed by carrying the rifle at trail arms.

APPENDIX C

WEIGHT CONTROL AND PERSONAL APPEARANCE PROGRAM

1. PURPOSE. The purpose of weight control and military appearance in the Marine Corps, is to uphold the high traditions that have been associated with a military image. In the Marine Corps this is simply being neat and trim in appearance. These standards are also important for combat readiness for it is essential that all Marines remain in good health, fitness, and appearance. The habits of self discipline required to gain and maintain a healthy body, inherent in the Marine Corps way of life, must be a part of the character of every Marine.

2. RESPONSIBILITY. The evaluation of a Marine's military appearance is the responsibility of the commanding officer. The medical officer's responsibility is to certify a Marine's health and ability to participate in physical training and/or prescribe a diet, if required, to return the Marine to an acceptable military appearance.

3. OBJECTIVE. The objectives of the Marine Corps Weight Control and Personal Appearance Program are:

a. To contribute to the health and well being of every Marine.

b. To preserve high standards of professional military appearance traditionally expected of all Marines.

c. To establish acceptable weight standards for all Marines and to ensure those Marines who do not meet the standards are counseled and given the opportunity to achieve the standards.

d. To encourage all Marines to set the example by maintaining proper appearance and weight standards.

4. POLICY GUIDELINES. Commanders will monitor and place on the program any Marine who fails to maintain the standards set forth in MCO 6100.10.

a. A commanding officer can use educational materials and programs and other motivational means to encourage Marines to achieve and maintain them selves in accordance with MCO 6100.10.

b. Commanders will measure and weigh Marines semiannually. Only those exceeding height/weight standards (18% Male/26% Female) will undergo a body fat assessment. Measurement for percent body fat will be taken on the same day as the height/weight measurement. Marines will be considered within standards if they meet the body fat standards and present an acceptable military appearance. Marines exceeding both maximum allowable weight and body fat standards will be assigned to the weight control program. They will be taken off the program when they meet either the maximum allowable weight or when they meet the body fat standards. A Marine who presents an unacceptable military appearance due to improper weight distribution will be assigned to a military appearance program.

c. Women Marines have six (6) months after returning from maternity leave from the date of delivery to reestablish their weight and military appearance standards as set forth in MCO 6100.10.

d. Marines that are identified as "Overweight" will be referred to a medical officer. If the medical officer discovers that the Marines problem is not due to underlying or associated disease that causes increase in weight, the finding will be certified and a reducing diet and/or exercise program recommended.

e. Realistic goals must be set as established in the MCO 6100.10, to include the number of pounds and/or inches that need to be lost. Weigh-ins or measurements will be taken at least every two (2) weeks, (monthly for SMCR), at the unit level to determine the individuals progress. If no loss is noted, then the Marine will be counseled at the unit.

f. In a case where weight loss in not required, then the commander will initiate an exercise program to correct the individual's military appearance. Any failure to meet either weight or military appearance standards will be reflected in section "C" of the Marine's fitness report.

g. If weight has been lost and the weight goal not met, one extension may be granted for a period of six months. If the weight goals are not met, the Marine will be recommended for discharge from the naval service by reason of unsatisfactory performance per the provisions of paragraph 6206.1 of reference (a) of MCO 6100.10.

h. If satisfactory progress has not been made, it can be concluded that the condition is because of apathy or a lack of self-discipline. Again, the Marine will be recommended for discharge.

i. The commander will administratively remove the individual from weight control or military appearance program once the prescribed goals are met. Appropriate entries will be made in the JUMPS/MMS per reference (e) of MCO 6100.10.

j. If the weight problem returns after the Marine has been removed from the program, that Marine will be accorded one 90 day period to conform to the standards. If after 90 days the goals are not met, the Marine will be processed for Administrative Discharge. If a Marine is currently on weight control under the old standards, but meets the new standards, he will still be considered as having been previously assigned.

k. A copy of enclosure (4) of MCO 6100.10 will be placed on the document side of the OQR/SRB for those Marines that are transferred while on the subject program. It is imperative that all JUMPS/MMS entries concerning weight control and military appearance be coordinated between the unit diary clerk and the training NCO.

5. GUIDELINES FOR BODY FAT MEASUREMENT.

a. Marines will be measured for body fat by personnel responsible for monitory the unit's weight control program or by medical personnel. Male and female Marines will be measured by individuals of the same gender.

b. Procedures for determining percent body fat require the use of a standard, non-stretching tape measure. The tape should be applied to body landmarks with sufficient tension to keep it in place without indenting the skin surface. Marines should report for measurements in PT gear. With the exception of the hip measurement for women, all measurements will be taken on bare skin.

c. To ensure greater accuracy, measurements will be taken twice. The lower of the two measurements is recorded. At each body site that is measured, ensure sufficient tension is placed on the tape to hold it in place against the body without indenting the skin. An added assist may be gained by placing a paper clip to hold the tape in position. This will help to keep the tape taut to prevent slippage and enable the measurer to step back and observe for proper tape placement.

6. PROCEDURES FOR PERCENT BODY FAT MEASUREMENT (MALE).

a. Measure height without shoes up to the nearest half inch. Instruct the Marine to stand with feet together and flat on the deck. Take a deep breath and stand fully erect.

b. Measure the neck circumference by placing the edge of the tape measure flush with the bottom of the larynx (Adam's Apple) and perpendicular to the long axis of the neck. The Marine should look straight ahead during the measurement with shoulders down (not hunched). For neck measurements in excess of the whole inch, round the measurement up to the nearest ½ inch (16 ¼ is rounded up to 16 ½).

c. Measure abdominal circumference against the skin at the navel, level and parallel to the deck. Arms are at the side. Take measurement at the end of the Marine's normal, relaxed exhalation. Round this measurement down to the nearest ½ inch.

d. Determine percent body fat by subtracting the neck from the abdominal measurement and comparing this value against the height measurement. Table 101-1 lists the value for each height that gives the Marine an 18% body fat. (If you want a more complete table, look it up in the MCO.) Male Marines must be at the given value or under to be within acceptable body fat standards.

EXAMPLE: A 73 inch tall male Marine weighs 210 pounds. Since he is not within weight standards, you measure him for body fat. (If he were only 209 pounds, you would not measure him for body fat.) He has a neck measurement of 17 ¼ and a waist measurement of 37 ¾. Round the neck measurement up to 17 ½ and the waist measurement down to 37 ½. Subtract the neck from the waist to get a value of 20 inches. Look on the chart for 73 inches. A value of 20.5 gives a 73 inch tall male Marine a body fat of 18%. Since he is under this value, he is under 18% body fat and is within acceptable standards.

Height	60	60.5	61	61.5	62	62.5	63	63.5	64	64.5	65	65.5
18% Value	17.5	18	18	18	18	18	18.5	18.5	18.5	18.5	19	19

Height	66	66.5	67	67.5	68	68.5	69	69.5	70	70.5	71	71.5
18% Value	19	19	19	19.5	19.5	19.5	19.5	19.5	20	20	20	20

Height	72	72.5	73	73.5	74	74.5	75	75.5	76	76.5	77	77.5
18% Value	20	20.5	20.5	20.5	20.5	20.5	21	21	21	21	21	21.5

Table 106-1.

7. PROCEDURES FOR PERCENT BODY FAT DETERMINATION (FEMALE).

a. Measure height without shoes up the nearest half inch. Instruct the Marine to stand with feet together and flat on the deck. Take a deep breath and stand fully erect.

b. Measure the neck circumference by placing the edge of the tape measure flush with the bottom of the larynx (Adam's Apple) and perpendicular to the long axis of the neck. The Marine should look straight ahead during the measurement with shoulders down (not hunched). For neck measurements in excess of the whole inch, round the measurement up to the nearest ½ inch (13 3/8 is rounded up to 13 ½).

c. Measure the natural waist circumference against the skin at the point of minimal abdominal circumference, usually located about halfway between the navel and the lower end of the sternum (breast bone). When his site is not easily observed, take several measurements at probable sites and use the smallest value. Ensure the tape is level and parallel to the deck. Arms are at the side. Take measurement at the end of the Marine's normal, relaxed exhalation. Round this measurement down to the nearest ½ inch.

d. Measure the hip circumference while facing the Marine's right side by placing the tape around the hips so that it passes over the greatest protrusion of the buttocks as viewed from the side. Ensure the tape is level and parallel to the deck. Apply sufficient tension on the tape to minimize the effect of clothing. Round the hip measurement down to the nearest ½ inch.

e. Determine percent body fat by adding the waist and the hip measurement, subtracting the neck measurement, and comparing values against the Marine's height measurement. Table 101-2 lists the value for each height that gives the Marine an 18% body fat. (If you want a more complete table, look it up in the MCO.) Female Marines must be at the given value or under to be within acceptable body fat standards.

Height	58	58.5	59	59.5	60	60.5	61	61.5	62	62.5	63	63.5
26% Value	51	51	51.5	52	52	52.5	52.5	53	53.5	53.5	54	54.5

Height	64	64.5	65	65.5	66	66.5	67	67.5	68	68.5	69	69.5
26% Value	54.5	55	55	55.5	56	56	56.5	57	57	57.5	57.5	58

Height	70	70.5	71	71.5	72	72.5	73	73.5	74	74.5	75	75.5
26% Value	58.5	58.5	59	59	59.5	60	60	60.5	60.5	61	61.5	61.5

Table 106-2.

APPENDIX D

IMMEDIATE CARE FOR OVERUSE INJURIES

1. Injuries usually occur when the increase of the exercise workload is performed too often and too fast. Many injuries can be prevented by a well designated program, to include warm-ups, cool-downs, and stretching. But injuries still occur. In the event that an injury occurs, stop exercising immediately, and SEEK MEDICAL attention. Most overuse injuries may be treated on the spot while waiting for medical assistance. The actions taken for overuse injuries are Rest, Ice, Compress, and Elevation (remember RICE.)

a. Rest. Allows the injury to heal without injuring the damaged tissues further.

b. Ice. Reduces inflammation, slows swelling, and promotes healing.

c. Compression. Reduces swelling by increasing pressure to force fluids from the injured area back into the body's system. This is usually used when applying ice.

d. Elevation. Allows gravity to help move the fluid into the body's system away from the damaged tissues.

The most common overuse injuries are shin splints, ankle /muscle sprains, foot arch trauma, Achilles rupture, and knee pain. Remember, ALWAYS refer the injured to medical personnel for follow-up, and do not arbitrarily take matters into your own hands.