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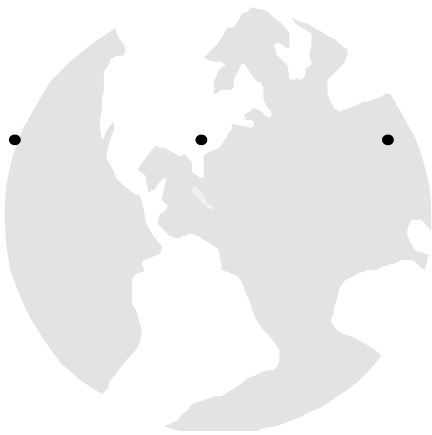
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# St. Louis Metropolitan Police Department

## Entry-Level Police Officer Examination

### Physical Ability Test Candidate Preparation Guide



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## INTRODUCTION

This Candidate Preparation Guide has been distributed to help you prepare for the St. Louis Metropolitan Entry-Level Police Officer's Physical Ability Test. Separate guides will be provided for the Law Enforcement Aptitude Battery (LEAB) or Written Examination and the Oral Board Test. The Physical Ability Test Candidate Preparation Guide is divided into five major sections as follows:

- **Section I: Summary of Physical Ability Test** - This section provides a description of the Physical Ability Test in which candidates will participate as part of the St. Louis Metropolitan Police Department (SLMPD) Police Officer Examination.
- **Section II: Preparing to Begin a Fitness Program** - This section begins with a discussion of health factors that may affect your ability to perform the fitness program and the Physical Ability Test, continues with a discussion of principles of training and concludes with a fitness test for assessing your current level of fitness.
- **Section III: Fitness Program** - This section presents a fitness program designed for a twelve week period. The program includes warm-up exercises, calisthenics, weight training, aerobic training and cool-down exercises.
- **Section IV: Weekly Log Pages** - This section provides log pages so that you can track your progress while participating in the fitness program.
- **Section V: References** - This section lists the references used to develop the physical conditioning program. You can review these reference sources if you would like further information about physical fitness.

## **SECTION I: SUMMARY OF PHYSICAL ABILITY TEST (PAT)**

### **A. General Description**

The Physical Ability Test (PAT) is designed to assess a candidate's capacity to perform the tasks ordinarily performed by a police officer while on the job. This is accomplished by requiring candidates to perform a series of activities that simulate police officer tasks in order to measure the physical abilities required to perform the police officer's job. These abilities include cardiovascular fitness, muscle strength, muscular endurance and flexibility. The fitness program presented in this preparation guide provides candidates with the information they need to improve their level of physical fitness by conditioning the individual muscles and muscle groups involved in the tasks performed by police officers and the activities that comprise the PAT.

### **B. St. Louis Metropolitan Police Officer PAT**

Run the perimeter of the Police Academy Gymnasium (approximately 230 yards), then negotiate the following obstacles:

- Jump over a one (1) foot hurdle,
- Jump over a two (2) foot hurdle,
- Negotiate around a cone,
- Jump a four (4) foot long jump,
- Negotiate around cone,
- Walk across a six (6) inch by six (6) inch by eight (8) foot beam,
- Negotiate around a cone,
- Approach a mat, drop down and touch chest to the floor, stand up, drop back down, touch shoulder blades to the floor, stand up,
- Negotiate around cone,
- Jump or climb over a four (4) foot wall,
- Negotiate around a cone,
- Go up stairs (6 up and 6 down),
- Repeat stairs,
- Advance to power training machine, push 75 pounds, walk in a semi-circle, pull 75 pounds, walk in a semi-circle,
- Drag 150 lb. dummy 50 feet,
- Sprint 50 yards, and
- Dry fire weapon five times with each hand.

The test is approximately 444 yards or  $\frac{1}{4}$  of a mile in length. We encourage you to thoroughly condition yourself before attempting to take the PAT, by participating in the fitness program provided in this preparation guide, and engaging in whatever additional preparation you believe will enhance your chances of performing effectively on the PAT.

Candidates are advised of the following:

- Wear clothing appropriate for physically demanding work. Wear long pants, such as a warm-up suit or sweatpants.
- You must wear sneakers or rubber soled shoes.
- You may wear gloves and/or kneepads, however, these items WILL NOT be provided. You must bring your own gloves and kneepads if you want to wear them.
- Candidates may not use any extraneous piece of equipment (e.g., harnesses, straps) that they bring with them to help perform an event. They may only use the material and equipment provided for the test event. However, personal safety devices (e.g., knee brace, ankle brace) will be allowed, but they WILL NOT be provided.

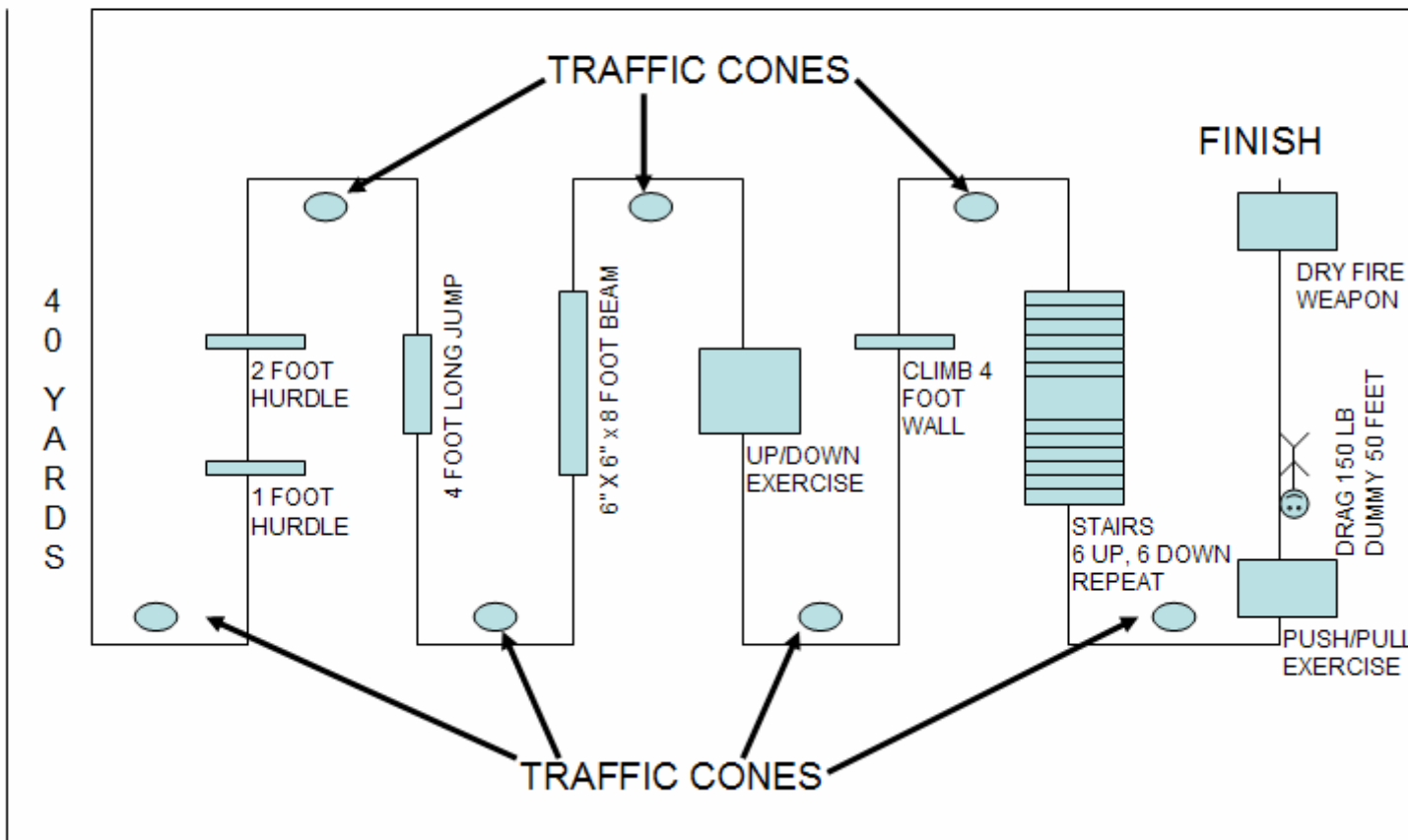
Because the PAT is physically demanding, it is suggested that you refrain from eating at least two hours before the test. However, you are urged to drink plenty of fluids beginning the day before the test and continuing up until the time you are tested. Avoid drinking caffeinated beverages. You are also advised to stretch and warm-up before participating in the PAT.

C. PAT Illustration

# ST. LOUIS METROPOLITAN POLICE DEPARTMENT FIT FOR DUTY TEST

START

110 YARDS AROUND X 2



## SECTION II: PREPARING TO BEGIN A FITNESS PROGRAM

### A. Medical and General Health Factors

#### **Health Screening for Physical Activity**<sup>1</sup>

To optimize your safety during the PAT and fitness program in preparation for the PAT, we recommend that you participate in screening for important medical and health factors. The objectives of this type of pre-participation screening include:

- Identifying those candidates who have medical conditions that would either be aggravated by exercise, or pose an immediate risk when coupled with exercise,
- Identifying those candidates who have signs and symptoms that suggest a problem, or risk factors for diseases that should receive further medical evaluation before participating in a fitness program or the PAT, and
- Identifying those candidates who may have special exercise requirements or who should take special precautions prior to exercising. For example, taking a diuretic (water pill) for moderate hypertension means that you should take care to drink extra fluid before, during, and after exercise.

It is not necessary for everyone to get a thorough physical examination prior to starting a fitness program. Such a requirement is not scientifically necessary, cost-effective, or time-efficient; however, if going to your physician would make you feel better about beginning a fitness program, by all means do so.

The Physical Activity Readiness Questionnaire (PAR-Q) is recommended as a minimal standard for screening prior to beginning a fitness program or, if some activity is already underway, prior to exercising more vigorously. The PAR-Q is designed to identify the small number of adults for whom physical activity might be inappropriate and those who should have medical clearance prior to exercise and testing.

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<sup>1</sup> Portions of the following are adapted from the American College of Sports Medicine, *Guidelines for Exercise Testing and Prescription*, 5th edition, Williams and Wilkins, Baltimore, 1995, with the permission of the editor.

### Physical Activity Readiness Questionnaire (PAR-Q)<sup>2</sup>

1. Has a doctor ever said you have a heart condition and recommended only medically supervised physical activity?	YES	NO
2. Do you have chest pain brought on by physical activity?	YES	NO
3. Have you developed chest pain within the last month?	YES	NO
4. Do you tend to lose consciousness or fall as a result of dizziness?	YES	NO
5. Do you have a bone or joint problem that could be aggravated by the proposed physical activity?	YES	NO
6. Has a doctor ever recommended medication for your blood pressure or a heart condition?	YES	NO
7. Are you aware, through your own experience or a doctor's advice, of any other physical reason why you should avoid exercising without medical supervision?	YES	NO

**If you answered YES to any of these seven questions, vigorous exercise and physical testing should be postponed until medical clearance is obtained.**

Question number seven of the PAR-Q is an open-ended question which covers medical and physical problems which make further medical screening necessary. Many individuals may question whether certain conditions are important enough or severe enough to warrant seeing their doctor. The next table provides additional information, including an indication of signs and symptoms suggestive of underlying diseases, risk factors for heart disease which in combination, suggest the need for medical screening, and a list of conditions which may increase the risk of complications during exercise.

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<sup>2</sup>From: Thomas, S., J. Reading, and R.J. Shephard. *Revision of the Physical Activity Readiness Questionnaire (PAR-Q)*. Canadian Journal of Sport Science 17:338-345, 1992.



## Signs or Symptoms of Underlying Risk Factors

1. Major Signs or Symptoms which Suggest Heart, Lung, or Metabolic Disease:

- Pain, discomfort or numbness in the chest, arm, jaw, neck or back
- Unaccustomed shortness of breath or shortness of breath with mild exertion
- Difficult or painful breathing
- Ankle swelling
- Palpitations or racing heart rate
- Leg pain
- Known heart murmur

**If you have any of these symptoms, vigorous exercise or physical testing should be postponed until medical clearance is obtained.**

2. Major Heart Disease Risk Factors:

- Systolic blood pressure  $\geq 160$  mmHg or diastolic blood pressure  $\geq 90$  mmHg (measured on at least 2 separate occasions)
- Serum cholesterol  $\geq 240$  mg/dl
- Cigarette smoking
- Family history of heart disease or stroke in parents or siblings prior to age 55

**If you have two or more of these risk factors, vigorous exercise or physical testing should be postponed until medical clearance is obtained.**

3. Diabetics who:

- take insulin
- have had diabetes for more than 15 years
- who do not take insulin but are over 35 years of age

**Should get medical clearance prior to beginning a fitness program.**

4. It is also recommended that men over the age of 40 and women over the age of 50 have a physical examination prior to beginning a vigorous fitness program. "Vigorous" means that the amount of exercise represents a challenge and will result in fatigue within 20 minutes. Healthy persons of any age can begin a low intensity fitness program without physician clearance, provided that the above conditions are adhered to.

No set of guidelines can cover every conceivable situation. In general, if you know that you have a problem or disease, see your physician first. Some other conditions which indicate a need for medical screening include alcoholism, drug use or abuse, problems with dehydration or an inability to tolerate heat, and acute infections (including severe colds and flu symptoms). Pregnant women, or women who think they may be pregnant, should consult a physician prior to beginning a fitness program even if they have been physically active prior to the pregnancy.

## **Height and Weight**

The first part of this section identified medical conditions that would pose a risk to candidates while participating in physical activity. In addition to the medical conditions, there are a number of general health factors which can be used to assess your current level of fitness and help determine whether you are ready to participate in the PAT and perform the physical activities required of police officers on the job. One such factor is to review the height and accompanying weight chart presented below. Falling outside of the weight ranges or the body fat percentage, may not prevent you from participating in the PAT but it may be an indicator of potential risks when participating in the fitness program provided in this guide and during the PAT. If you are concerned about your current weight or amount of body fat or exhibit high levels beyond the guidelines suggested, you should seriously consider consulting a physician and or engaging in a weight control program (see next section) prior to initiating a rigorous fitness program and taking the PAT. In addition, if you have numerous warning signs or fall well outside the desired levels, you may need to reconsider whether you are capable of completing a fitness program and the PAT in the near future, and handling the physical demands of serving as a police officer on a daily basis.

### **HEIGHT AND ACCOMPANYING WEIGHT RANGES\***

<b>MALES</b>		<b>FEMALES</b>	
<b>Height</b>	<b>Weight</b>	<b>Height</b>	<b>Weight</b>
5'0"	106 – 146	5'0"	96 – 138
5'1"	109 – 151	5'1"	99 – 141
5'2"	111 – 155	5'2"	102 - 144
5'3"	114 – 159	5'3"	105 - 149
5'4"	117 – 163	5'4"	108 - 152
5'5"	120 – 167	5'5"	111 - 156
5'6"	124 – 173	5'6"	114 - 161
5'7"	128 – 178	5'7"	118 - 165
5'8"	132 – 183	5'8"	122 - 169
5'9"	136 – 187	5'9"	126 - 174
5'10"	140 – 193	5'10"	130 - 179
5'11"	144 – 198	5'11"	134 - 185
6'0"	148 – 204	6'0"	138 - 190
6'1"	152 - 209	6'1"	142 - 195
6'2"	156 - 215	6'2"	146 - 200
6'3"	160 - 220	6'3"	150 - 205
6'4"	169 - 231	6'4"	154 - 210
6'5"	174 - 238		
6'6"	179 - 247		
6'7"	184 - 256		

\*If the desirable weight range is not achieved, you may also want to consider your percentage of body fat. The acceptable percentage of body fat is up to 19% for men and up to 23% for women.

## **Weight Control**

Carrying excess weight will reduce a candidate's performance potential on the PAT. Excess weight increases the work that the muscles, heart, and lungs have to do when performing tasks. For example, when an overweight person walks up stairs, the leg muscles have to lift more weight. The heart also has to pump more blood to those working muscles, putting additional stress on the heart. When muscles have to work harder, against the stress of carrying excess weight, injuries can occur ranging from pulled leg muscles to a heart attack.

In an effort to promote safety and optimal health, it is recommended that overweight candidates try to lose weight before participating in the PAT. To best accomplish this, overweight candidates should begin a weight reduction program that contains nutrition and an exercise component. Weight loss can best be achieved by: (a) decreasing the amount of food you normally eat through the reduction of portion sizes, (b) changing a few "bad habits" such as the amount of high fat food selections you make, and (c) increasing the amount of exercise you are presently getting.

1. Through reduction of food intake. A successful weight loss program always includes an eating plan designed to provide the right amount of vitamins, minerals and calories to avoid hunger pangs and any possible nutrient deficiencies. Nutritionists suggest the following method to assess your current caloric intake and to appropriately cut back calories. To determine your current caloric intake:

**Multiply your present weight by the number 15.**

The answer is the average number of calories you are eating daily to maintain your current body weight. The number 15 is used because it takes approximately 15 calories to maintain one pound of body weight.

Now that you know the average number of calories you're eating, to lose weight, you need to reduce this amount by between 500-1000 calories per day. To demonstrate the effect of reducing your caloric intake, look at the following examples:

### **EXAMPLES:**

- 3500 calories = 1 pound of body weight
- 500 calories x 7 days a week = 3500 calories (1 pound)
- 1000 calories x 7 days a week = 7000 calories (2 pounds)

By cutting back 500 calories per day, you will be able to lose approximately 1 pound of body weight per week. Cutting back 1000 calories per day allows you to lose approximately 2 pounds of body weight per week. Losing any more than 2-3 pounds of body weight in one week could be detrimental to your health and also increases the chances of gaining the weight back more quickly. So, go slowly and steadily.

Some people will lose less than a pound in one week and perhaps 2 pounds the next. There often is no clear way to gauge weight loss, but be confident that if you're cutting back on calories, you will definitely see a difference over the long haul.

2. Through exercise. An exercise program is also a key component of losing weight and keeping it off. For example, if you don't want to cut your calories by 1000 per day but still want to lose 2 pounds per week, you can cut calories by 500 and increase exercise to burn 500 calories through energy expenditure. The results will be the same - - a 2 pound weight loss. Here are some examples of ways to burn roughly 500 calories through energy expenditure:

**EXAMPLES:**

- walk 5 miles (takes 100 minutes)
- jog 5 miles (takes about 55 minutes)
- climb stairs for 80 minutes
- cycle or row for 60 minutes

3. Through appropriate food selection. Now that you realize some of your weight loss options, the next step is to select appropriate foods. The first goal should be to identify the foods you're currently eating that are too high in fat. Some examples might include:

**EXAMPLES:**

- peanut butter
- ice cream
- butter or margarine on toast, vegetables, popcorn, potatoes, etc.
- large amounts of meats and their skins
- fried foods such as french fries, fried chicken, fried eggs, etc.
- cheese, sour cream, cream cheese, mayonnaise, salad dressings
- high fat desserts such as cookies, pies, cakes, pastries and donuts
- fatty meats such as ribs
- oils

Although fat is an essential nutrient, you need to be careful not to eat too much of it. You should only get about 20-30 percent of your total daily calories from fat. But rather than try to calculate what that number should be, your goal should be to cut back as much as possible.

Your next step is to assess how many fruits and vegetables you are eating. The recommended number of fruits is 2-4 pieces per day (or 2-4 cups of canned fruit in its own juice). Vegetables can be eaten cooked or raw to total 2-4 cups per day. In many cases, vegetables can be eaten in any quantity due to their very low calorie content. Finally, assess how many foods you eat from the grain, cereal, and bread category. It is recommended that the majority of food you eat in a day come from these foods, 6-11 servings per day. Examples include:

**EXAMPLES:**

- rice
- pasta/noodles
- potatoes, corn, peas, dried beans such as navy, pinto, garbanzo and black beans
- all types of bread, bagels, muffins
- all types of cereal
- cornmeal
- stuffing
- sweet potatoes, squash, yams

These foods are referred to as complex carbohydrates. They are responsible for providing you with the most available form of energy, glucose. Consequently, your diet needs to be plentiful in them, yet you can still lose weight due to their typical high fiber content.

Protein rich foods should be treated with care. Only 12-15% of your total daily calories need to come from protein rich foods such as meat, eggs, milk, yogurt, and other dairy products. Look for lean meats; remove skin from chicken and fish; trim all fat off meat; and select skim milk, nonfat yogurt, and lower fat cheeses, such as mozzarella.

An example of a balanced eating plan that can be adapted to your desired caloric intake appears below.

<b>SAMPLE EATING PLAN</b>
<p><b>Breakfast</b></p> <ul style="list-style-type: none"><li>▪ 1-2 cups of cereal (a high fiber one is best, but any will do)</li><li>▪ 1 cup of skim milk</li><li>▪ 1 piece of fruit (any kind)</li><li>▪ 1-2 slices of toast or a bagel or English muffin with jam or jelly (no butter)</li></ul>
<p><b>Snack</b></p> <ul style="list-style-type: none"><li>▪ 1 piece of fruit (any kind)</li></ul>
<p><b>Lunch</b></p> <ul style="list-style-type: none"><li>▪ 1 sandwich made with:<ul style="list-style-type: none"><li>- 2 slices whole wheat bread,</li><li>- 3-4 ounces of turkey, or chicken, or fish</li><li>- mustard and no mayo</li><li>- tomatoes, lettuce, pickles</li></ul></li><li>▪ a bag of raw vegetables including carrots, celery, broccoli, cauliflower</li><li>▪ 1 piece of fruit (any kind)</li><li>▪ 1 cup of low fat or nonfat yogurt</li><li>▪ 1 small bag of pretzels</li><li>▪ a non-caloric beverage of your choice, or water</li></ul>
<p><b>Snack</b></p> <ul style="list-style-type: none"><li>▪ pretzels (small bag), fruit, vegetables, or yogurt</li></ul>
<p><b>Dinner</b></p> <ul style="list-style-type: none"><li>▪ 5-6 ounces of meat of your choice</li><li>▪ a potato or 2 cups of rice or 2 cups of pasta or 2 slices of bread</li><li>▪ any amount of vegetables without butter or margarine on them</li><li>▪ 1 piece of fruit</li><li>▪ 8 ounces of skim milk or 8 ounces of nonfat yogurt</li></ul>

**Note:** Additional calories may be obtained from other low fat sources.

## **Meal Planning**

Always eat three regular size meals as shown in the Sample Eating Plan, or six small meals every day. The purpose behind this advice is two-fold. First, you spread your calories throughout the day allowing adequate blood sugar for energy. Second, by eating periodically, you are never "starving." By withholding calories by skipping a meal, you allow your blood sugar to drop so low that your body will crave high fat, high sugar calories causing you to eat candy bars and other immediate sweets to satisfy the craving. You can prevent this by eating regularly.

Select foods that contain carbohydrate, protein, and fat for each meal. Since carbohydrates empty from the stomach the quickest, providing excellent and immediate energy, they should be the largest part of any meal. Protein is the next nutrient to leave the stomach and fat the last. Both of these nutrients help keep you feeling full for a longer period of time since they stay in the stomach longer.

There are many misconceptions and fallacies about diets and exercise. The truth about some of the most common misconceptions is discussed below:

1. **FALSE:** Exercise will increase your appetite.

Exercise does not increase appetite. In fact, it can actually act as an appetite suppressant. In other words, it may decrease your appetite. Exercise also serves to stimulate metabolic rate, or the rate you burn calories, after exercise is over.

2. **FALSE:** A lot of extra weight is "water-weight," and you can lose weight by sweating or drinking less fluid.

Exercising in rubber suits, in saunas or steam rooms will only increase your loss of body water and dehydrate you, giving you a "false sense" of weight loss. Dehydration is not an effective way to lose weight. Since the body is made up of 70% water, it makes sense to drink plenty of fluids each day to maintain proper fluid balance. We lose body fluids, without really knowing it, through our skin as well as through sweating. Weighing yourself after exercise and seeing a decrease in body weight is not an appropriate way to assess true weight loss. You need to drink fluids to replace lost water. In fact, you should drink a little more water than what quenches your thirst to fully prevent dehydration.

3. **FALSE:** Fad diets and gimmicky exercise programs are effective.

You cannot lose body fat unless you decrease total calories (not just fat calories).

4. **FALSE:** Dieting is a short-term way to lose weight.

The concept of "diet" typically implies some form of eating plan that you will follow for a short period of time. Consider the fact that the body has a set number of fat cells that NEVER die until the day that you do. Consequently, losing weight by changing eating habits must be continued to maintain lost weight. By "going off the diet" you will inevitably gain back the lost weight. So concentrate on changing your few bad habits slowly and permanently, and include exercise.

5. **FALSE:** Quick-reducing diets are effective.

Diets that promise rapid weight loss are typically short-term programs. When you lose more than 2-3 pounds per week, you are not only losing fat, but also muscle mass and water. As soon as the low calorie diet, quick weight loss scheme wears you down, you'll revert back to your more pleasant way of eating and gain all the lost weight back and, typically, more.

6. **FALSE:** You can spot reduce in specific areas of your body.

You cannot "spot-reduce." In other words, by cutting back on your calories, you cannot specify where the changes in body reduction will occur. However, by exercising specific body parts, you can effectively strengthen certain muscle groups to give you a leaner, stronger look, but fat does not selectively disappear from those areas.

Three factors play key roles in determining weight loss in any given individual. The first is heredity. If you were born to overweight parents, you have a predisposition to being overweight. As a result, your ability to lose weight easily may be somewhat impaired due to your genetics. Secondly, environment plays a big role. What kinds of foods do you keep in the house, where do you socialize and does socialization usually mean food? Third, what is your activity level? Are you typically a more sedentary person? Try watching less television and work on more projects in the evening. Do you snack while sitting around? Try more movement in general. Think about where you can fit exercise in.

## **Smoking**

Inhaled smoke has been linked to lung cancer, lung disorders, and coronary heart disease. Smoking also affects a person's ability to perform aerobic tasks. The same mechanisms that eventually lead to lung disorders limit the ability of the lungs to take in air and distribute oxygen to the blood. This ability is particularly crucial when performing tasks that involve large muscle groups continually contracting for several minutes or longer. A candidate who smokes may be specifically affected in his or her ability to climb stairs or walk or run for any length of time. A smoker may not be able to do as well on an event that involves this type of activity as a non-smoker of similar size, ability and training. Therefore, in order to maximize their potential to do well on the PAT, candidates who smoke are urged to quit smoking as soon as possible.

In conclusion, successful, long-term weight loss involves many factors. Cutting back calories is critical to weight loss but it won't make you more fit or promote long-term weight management. That's where exercise fits in. The combination is the right approach. Set some realistic goals (1-2 lbs. per week) for weight loss through a change in eating habits and increased exercise. Keep food records to accurately assess what you are eating. Write down everything you eat for about a week and assess where you think some changes could reasonably be made. Keep an activity log. Strive for adding a few extra minutes of activity periodically until you reach 30-40 minutes of exercise a day.

## **B. Principles of Training**

### **Terms**

Some of the terms used in the fitness program presented in this guide are explained below, as are some of the principles upon which this fitness program is based. (Sharkey, 1979)

### **Physical Fitness**

**Physical fitness** is defined as "the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies" (President's Council on Physical Fitness and Sports). An adequate level of physical fitness is required to perform many jobs, to provide energy for recreational activities, and to help avoid some diseases (such as heart disease and osteoporosis). Physical fitness consists of the following components: cardiovascular fitness, muscle strength, muscular endurance and flexibility. In order to perform optimally at work and in our other daily activities it is necessary to develop and maintain adequate levels of fitness in each of these components. The fitness program presented in this guide is designed to develop all components of fitness because they are essential to performing the police officer's job and in maintaining good overall health.

**Cardiovascular fitness** (aerobic endurance, stamina) is a measure of heart and lung function. It is the ability to maintain whole body activity for a length of time without fatiguing or running out of breath. An adequate level of cardiovascular fitness is also associated with decreased mortality from many diseases.

**Muscle strength** (also referred to in this guide simply as "strength") is a measure of the greatest amount of force a muscle can apply; that is, the most weight a muscle group can move one time. In addition to its importance in many job-related tasks, improving muscular strength also helps prevent injuries to the muscles and makes bones and tendons stronger.

**Muscular endurance** is a measure of a muscle's ability to maintain a submaximal force or repeatedly apply a submaximal force without a rest; that is, the number of times you can lift a certain amount of weight. Adequate levels of muscular endurance allow your muscles to perform a task for a longer period of time before the muscles get tired. Poor endurance of the back and abdominal muscles has been implicated as the cause of much of the low back pain suffered by American adults.

**Flexibility** is a measure of the range of motion at a joint. Adequate levels of flexibility are necessary in order to make daily movements with ease and to help prevent injuries to muscles and joints. In addition, there is evidence to suggest that inadequate flexibility of the back and legs is related to low back pain.

### **Adaptation**

The stress of repeated exercise produces changes in the body that are called training effects. Your body undergoes some changes in structure and function that allow it to respond better to the demands of physical work and exercise. The body adapts to the extra demands imposed by training by undergoing the following changes:

- Heart function and circulation are improved.
- Blood pressure and cholesterol levels are improved.
- Muscle strength and muscular endurance are improved.
- Muscle mass increases and the portion of weight made up of fat decreases.

Training consists of exercising specific muscles or muscle groups and stressing different systems of the body. It involves having the muscle or muscles apply and maintain a force for a short time and/or repeatedly. Calisthenics, weight training, stretching, and aerobic activity are all important training methods that will result in adaptations that will enable the body to perform more effectively. The rate of improvement or adaptation is related to the following:

- Frequency of activity (the number of times you train per week).
- Intensity of activity (how hard you train).
- Duration of training (the length of each training session).
- Your initial fitness level.

### **Overload**

For improvement in fitness level to take place via adaptation, a part of the body must be subjected to more than it is accustomed to. For example, in order for muscle strength to improve, the muscles must apply a greater force than they normally would apply during regular daily activities. This increase in intensity of force, or overload, elicits an adaptation. Increasing the duration of an activity would also be an overload. As the body adapts to an increased load, more load must be added to continue adaptation.



## **Specificity**

The body adapts very specifically to the type of training it receives. The type of training must be related to the desired results or to the purpose of the training. Aerobic activity will cause very different body adaptations than will weight training. Thus, heavy weight training is of little value for cardiovascular endurance, and a lot of running is not particularly useful for developing upper body strength. In addition, adaptations are specific to the muscle groups that are trained. Thus, stretching the shoulder muscles in order to improve shoulder flexibility will not improve flexibility at any other joint, nor will it improve strength of the shoulder muscles. Performance of an activity improves when the training is applied to the same muscle groups as are used in the activity and in the same way they are used in that activity.

One exception to this specificity principle is cardiovascular endurance. The heart-lung system involved in cardiovascular endurance is vital in all activities that require large muscle groups to be active for any length of time. The specific activity used to train the cardiovascular system is, therefore, not critical, unless one is competing in athletic events.

## **Use and Disuse**

The body needs activity and does not "wear out." Lack of activity results in weak muscles, including the heart, poor circulation, shortness of breath, increased body fat, and weakening of bones and connective tissue. Regular activity results in good muscle tone, a strong heart, good circulation, endurance, and strong bones and connective tissue (ligaments, tendons, etc.).

## **Individual Response**

Individuals respond differently to the same fitness program. The differences in response may be the result of any of the following factors: heredity, physical maturity, state of nutrition, habits of rest and sleep, level of fitness, personal habits such as smoking and alcohol intake, level of motivation, the environment, and the influence of physical disability, disease, or injury.

## **Warm-up**

Warm-up is a gradual increase in intensity of physical activity and should always precede strenuous activity. A 5-10 minute warm-up period allows an individual to:

- Mentally prepare for exercising.
- Increase body temperature slowly.
- Stretch the muscles and joints.
- Increase heart rate and breathing gradually.

Warm-up consists of low intensity aerobic activity such as walking or slow jogging, followed by calisthenics and light stretching.

## **Stretching**

Muscle groups should be stretched in order to improve flexibility at a joint. Stretching exercises should be performed slowly and gently, without any bouncing, bobbing, jerking or lunging. Stretching exercises can be performed as part of the warm-up, following 5 minutes of low intensity aerobic activity, or as part of the cool-down phase.

## **Calisthenics**

Calisthenics are exercises that can be performed without equipment, although hand or ankle weights may be used. These types of exercises can be used to develop strength, muscular endurance, and flexibility. Calisthenics usually involve the repetitive lifting and lowering of a body segment as in push-ups, curl-ups, and arm circles.

## **Weight Training**

Weight training consists of exercises that involve moving a weight that is external to the body. Such exercises are used to develop strength, muscular endurance, and (sometimes) flexibility. Particular care must be taken if free weights (e.g., barbells) are used in weight training. They may cause injury if they fall or if undue strain occurs in trying to control the weight (e.g., to keep it from falling). This can happen as a result of hands slipping, if a person attempts to lift a weight that is too heavy for him/her to support, or if poor technique is used. For these reasons, weight machines may be safer for novices to use in weight training. If you use free weights for weight training, be sure to always work with a partner who can assist you.

## **Aerobic Training**

Aerobic training improves cardiovascular fitness. The training of the cardiovascular system is accomplished by continuous rhythmical motion over time, using large muscle groups. Jogging, bicycling, stair climbing, rowing, walking, swimming, hiking, cross-country skiing, skating, and aerobic dancing are good activities for aerobic training.

## **Cool-down**

The cool-down phase is as critical as the warm-up phase and should last 5-10 minutes. This phase of activity is important for the following reasons:

- It allows the heart rate to decrease gradually.
- Continued activity maintains adequate circulation, prevents pooling of blood, and hastens recovery.
- It provides a time for thorough stretching and relaxation activity.

Cooling down consists of slowing down your activity, walking, light calisthenics and stretching exercises.

## **Unusual Reactions**

If, during or immediately after exercise, you have any of the following reactions, stop exercising immediately and consult a physician as soon as possible:

- Labored or difficult breathing (not the deep breathing normally associated with exercise)
- Loss of coordination
- Dizziness
- Tightness in the chest
- Sharp pain in any muscle or joint
- Numbness

### **C. Assessing Your Current Level of Fitness**

This section contains instructions for a simple fitness test that you can use to assess your current level of fitness. Take the test now, before you begin the fitness program included in this guide, to determine your current level of fitness. Also, take the test at several intervals while you are participating in the fitness program before the PAT to measure your progress.

The events described in the fitness test are related to the four areas of fitness. A sit and reach test measures flexibility. Curl-ups, a flexed-arm hang, push-ups, and a jump and reach test measure strength and muscular endurance. A 1.5-mile run measures cardiovascular fitness.

Keep a record of your results each time you complete the fitness test. Do not be concerned about how your results compare to others who may be taking the PAT. Use your results to monitor your progress, to provide motivation, to establish goals, and to determine the effectiveness of the fitness program.

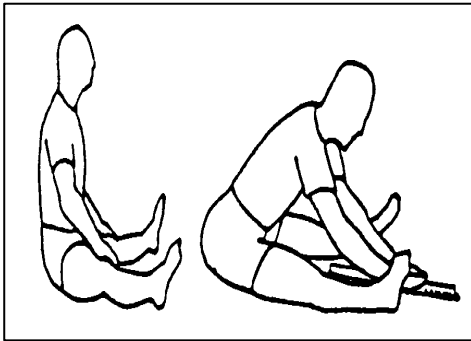
Here is a list of the equipment and facilities you will need to conduct the fitness test.

- Yard stick
- Masking tape
- Stop watch
- High bar to hang from (about 3/4 inch in diameter)
- Newspaper
- 1.5 mile measured distance (a high school track or measured running path)
- Scale to measure body weight
- Score Sheet (included within this guide on page 19)

## **Fitness Test Descriptions and Instructions**

Before beginning the fitness test, do five to ten minutes of warm-up. See the warm-up section of this guide for suggested exercises.

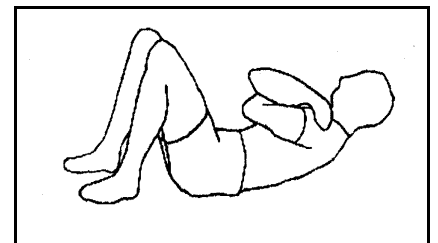
### **1. Sit and Reach**



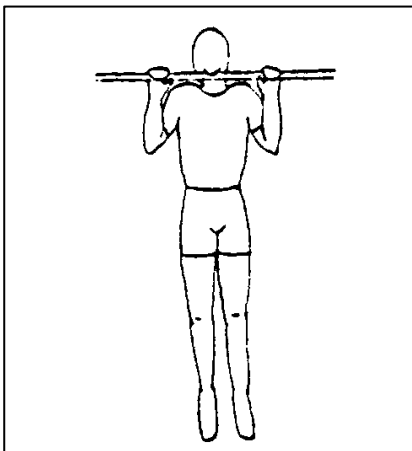
Tape a yard stick to the floor. Sit on the floor with the yardstick between your legs and the zero mark on the yardstick toward you. Keep your legs straight and place your heels even with the fifteen inch mark on the yard stick. Place your hands in front of you, one over the other. Slowly stretch forward, sliding your hands along the yardstick as far as possible. Do not bounce or lunge. Lean forward and stretch slowly as far as you can. Record the farthest distance you can reach in three attempts to the nearest inch.

### **2. Curl-Ups**

Lie face up on the floor with your legs bent and heels approximately 8-12 inches from your buttocks. Using your abdominal muscles, tilt your hips towards your ribcage as you raise your head and shoulders off of the floor pressing your lower back towards the floor. Your eyes should stay focused over your knees. Your hands and arms may be supporting your head, crossed over your chest, sliding up your legs as you raise off of the floor or resting on the floor. Record the number of curl-ups completed.



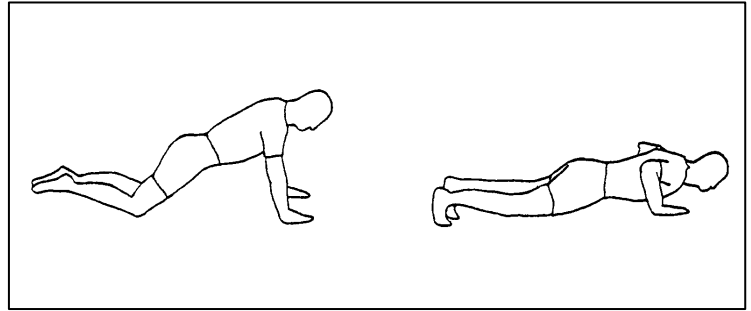
### **3. Flexed-Arm Hang**



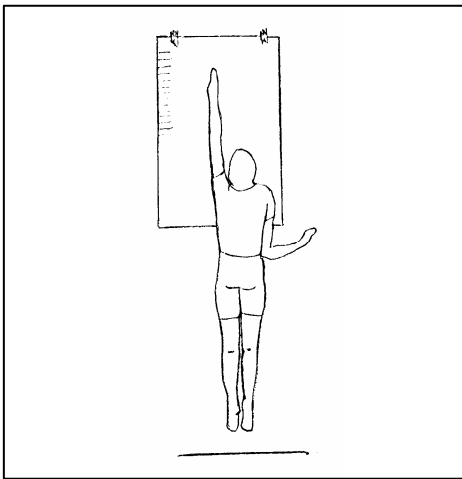
Assume a flexed arm position, palms facing away from your body, with your chin above the bar. Hold this position as long as possible. Record the amount of time you can hang with your chin above the bar.

#### 4. Push-Ups

Assume a prone position with your hands on the floor, just outside your shoulders. Your legs may be straight with your weight on your toes, or bent, with your weight on your knees if your initial strength level is low (e.g., if you cannot do three or four toe push-ups). Push up, keeping your back straight. Return until your chest almost touches the floor. Repeat as many times as possible. Record the number of push-ups completed.



#### 5. Jump and Reach



Using the yard stick, make marks on a newspaper at one inch intervals. Tape the piece of newspaper to the wall above your head. Dip the fingers of your dominant hand into water. With your dominant side toward the paper, jump as high as you can, reaching up with your dominant hand. At the top of your jump, touch the paper with your wet fingers. Repeat. Record the height of the highest jump out of two tries.

#### 6. 1.5 Mile Run

Determine the starting and end point for a 1.5 mile distance. Run and/or walk as fast as you can to cover this distance. Record the time it takes to complete the 1.5 mile distance.

## FITNESS TEST SCORE SHEET

1. Date of Test #1: \_\_\_\_\_ Body Weight: \_\_\_\_\_
2. Date of Test #2: \_\_\_\_\_ Body Weight: \_\_\_\_\_
3. Date of Test #3: \_\_\_\_\_ Body Weight: \_\_\_\_\_

	Test #1	Test #2	Test #3
<b>FLEXIBILITY</b>			
Sit and Reach (distance)			
<b>STRENGTH AND MUSCULAR ENDURANCE</b>			
Curl-Ups (number)			
Flexed-Arm Hang (time)			
Push-Ups (number)			
Jump and Reach (height)			
<b>CARDIOVASCULAR FITNESS</b>			
1.5 Mile Run (time)			

Copies of the fitness score sheet will have to be made if you participate in the fitness test on more than three occasions.

## **SECTION III: FITNESS PROGRAM**

### **A. General Directions for Fitness Program**

The fitness program is divided into the following sections:

- Warm-up
- Strength and Muscular Endurance Exercises (Calisthenics and Weight Training)
- Aerobic Training Exercises
- Cool-down

The strength and muscular endurance exercises do not have to be done on the same day or during the same exercise session as the aerobic training exercises. They may be done on separate days or at different times on the same day. However, every exercise session should be preceded by a warm-up period and followed by a cool-down period. For example, if the strength and muscular endurance exercises are done on the same day but at a different time than the aerobic training exercises, warm-up and cool-down exercises should be performed before and after each of the two sessions (strength and muscular endurance exercises).

The warm-up exercises are designed not only to get a person physically and mentally ready for the muscular and/or aerobic training exercises, but also to help develop flexibility in various joints. The strength and muscular endurance exercises can be done in one of two ways, depending on the availability of equipment. Some degree of strength and muscular endurance can be developed by doing calisthenics which require little or no equipment but is more typically accomplished by training with weights. Training with weights can be done either by using free weights, such as barbells, or by using weight machines, for example, "Universal" or "Nautilus" systems. Once you start a program using a particular method for strength and muscular endurance exercises, you should continue that program for the duration of the training period for comparative purposes.

Since there are no equipment requirements for the aerobic training exercises, the same program can and should be followed by everyone regardless of the type of program (i.e., calisthenics vs. weight training) chosen to develop strength and muscular endurance. A weekly log sheet is provided so that candidates can keep track of their progress in developing strength, muscular endurance, and cardiovascular fitness. Two types of log sheets are provided, one for calisthenics and aerobics (for those individuals who use calisthenics to train for strength and muscular endurance), and one for weight training and aerobics (for those individuals who use weights to train for strength and muscular endurance). Of course, candidates should use the log sheet that is designed for the particular fitness program they have chosen to follow. Copies of the log sheet will have to be made for each week that you participate in the fitness program.

#### **Training for the Physical Ability Test**

The sections that follow describe the exercises that you can perform to develop the four categories of fitness identified previously. The Warm-up section describes the warm-up exercises which are useful for the development of flexibility, and are an essential component of any fitness program. The Calisthenics and Weight Training sections describe the calisthenics and weight training exercises that can be used toward the development of strength and muscular endurance. The Aerobic Training section describes a program aimed at enhancing cardiovascular fitness. Finally, the Cool-down section, provides cool-down exercises which will aid in recovery from exercise, help develop flexibility, and are an important component of any fitness program.

## B. Warm-Up

The warm-up exercises should be performed for 5-10 minutes. The whole set of stretches described in this section of the guide should be performed before each exercise session. If the strength and muscular endurance exercises are performed on different days or at different times of the day than the aerobic exercises, the warm-up exercises should be performed before each separate session.

Each stretch should be performed in a slow manner. Move to the point that a stretch, not pain, is felt in the muscles. Hold that position for 10-20 seconds. Repeat each stretch 3-5 times.

Several traditional stretches are listed below. These stretches should be avoided because they may lead to injury. More effective stretches are listed and explained in this section of the Guide.

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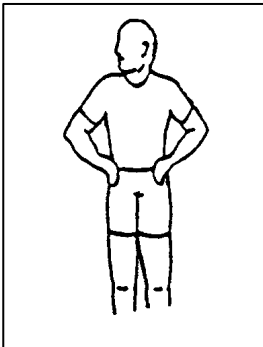
### **DO NOT DO THESE STRETCHES**

- Standing Toe Touch with Knees Locked
  - Hurdler Stretch
  - The Plow or Backover
  - Full Neck Circles
  - Back Hyperextension or Cobra
  - Back Bends
- 

### **Warm-up Stretch Descriptions**

The following stretches are effective for improving flexibility in each muscle group. Begin the warm-up period by performing light aerobic activity, such as stepping or jogging in place and arm circles.

#### **1. Side-to-Side Look**



#### **Stretches your neck muscles**

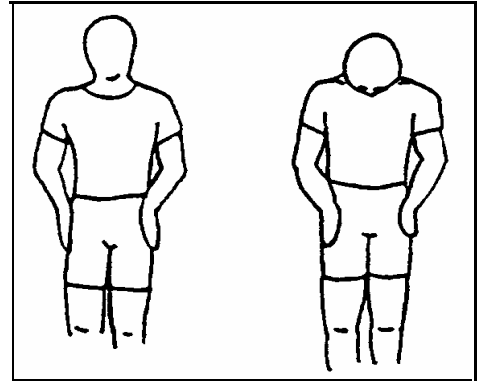
Slowly turn your head and look to the right, then slowly turn your head back to the center then slowly turn your head and look to the left.



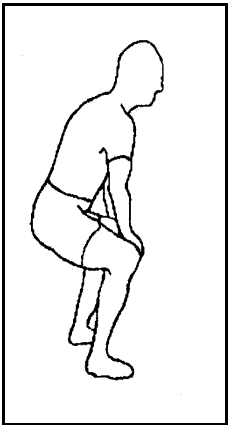
## 2. Forward and Down Look

### **Stretches your neck muscles.**

Slowly look downward. Do not put your chin on your chest.



## 3. Standing Cat Stretch



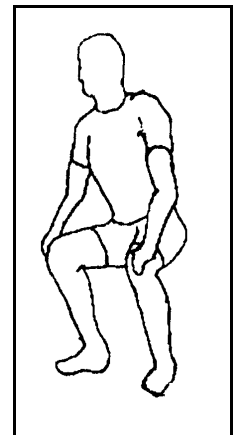
### **Stretches your upper and lower back.**

Stand with your feet slightly wider than shoulder-width apart. Keep your knees bent. Hinge forward at your hips and place your hands just above your knees. Do not bend at your waist. Begin with your back straight and flat, arch your back by pulling in with abdominals and curl your chin towards your chest. Return to the flat back position. Do not arch your back down past the flat back position.

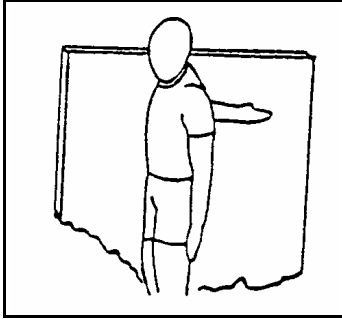
## 4. Shoulder Turn

### **Stretches your lower back.**

Stand with your feet slightly wider than shoulder-width apart. Keep your knees bent. Hinge forward at your hips and place your hands just above your knees. Do not bend at your waist. With your back straight and flat, gently press your left shoulder downward and bring your right shoulder upward with a smooth twisting motion. Repeat on your other side.



## 5. Chest Stretch



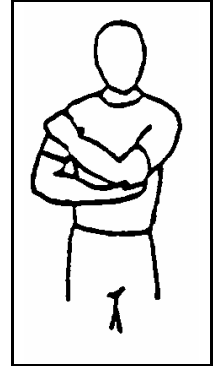
### **Stretches your chest muscles.**

Stand next to a wall approximately 8-12 inches away. Extend your arm back placing the palm of your hand on the wall below shoulder level. Your thumb should face the ceiling. Slowly rotate your body away from the wall. Repeat on your other side.

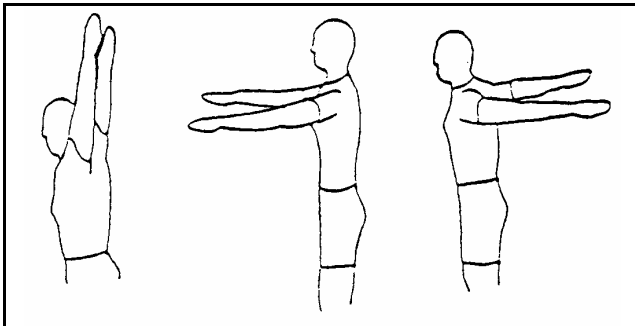
## 6. Shoulder Stretch

### **Stretches your shoulders and upper back muscles.**

Stand up straight with your feet shoulder-width apart and your knees slightly bent. Reach your left hand across your body to your right shoulder. Use your right hand to hold your left arm. Place your right hand on the back of your left arm just above your elbow. Gently press your left arm with your right hand. Do not rotate torso. Repeat on your other side.



## 7. Arm Circles



### **Stretches your chest and shoulder muscles.**

Standing with your feet shoulder-width apart and knees slightly bent, perform slow, full-arm circles backward 5 to 10 times, then forward the same number of times. The thumb-side of your hand should always lead and your arms should brush past your ears and the sides of your body.

## 8. Finger Extension-Flexion

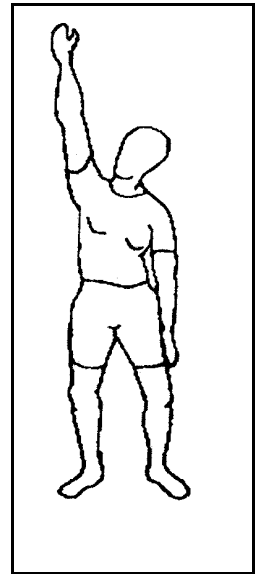
### **Stretches your finger muscles.**

Stand with your arms stretched in front, feet slightly apart and your palms facing the floor. Begin by extending your fingers to the open hand position. Bring your fingers together in a fist and repeat the motion of opening your hand to extend your fingers. Exercise both hands simultaneously. Perform this exercise 10 times.

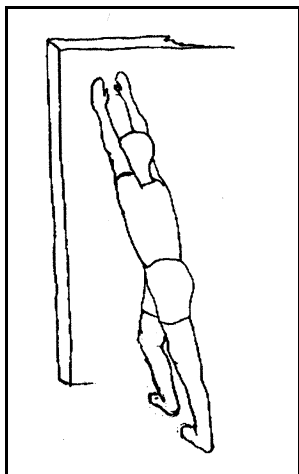
## 9. Side Stretch or Reach

### **Stretches the muscles on the sides of your trunk.**

Standing with your feet shoulder-width apart and your knees slightly bent, place your left hand on your left outer thigh and extend your right arm overhead with your thumb pointing backward. Reach straight up with your right hand as you slide your left hand down your thigh towards your knee until you feel a stretch up your side. Do not allow your right foot to raise from the floor. Repeat on your other side.



## 10. Wall Lean



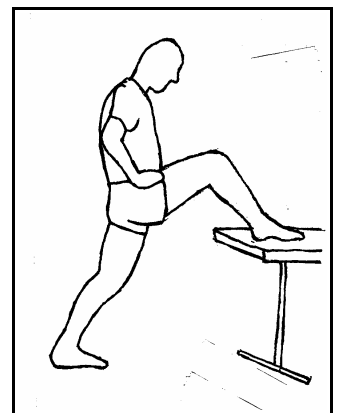
### **Stretches the muscles in the back of your lower legs.**

Stand about arms distance away from a wall with your feet slightly spread apart. Put both hands on the wall. Keeping your heel on the floor, toe slightly turned in and your leg straight, slide one foot back until a stretch is felt in your calf. Repeat on your other side.

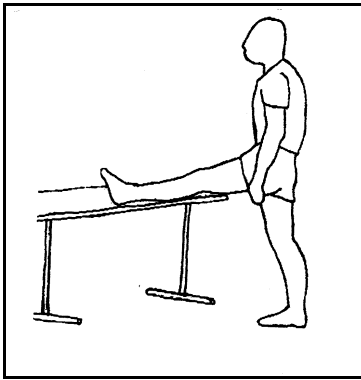
## 11. Stride Stretch

### **Stretches the muscles in the front of your thigh.**

Stand facing a sturdy bench approximately 2-3 feet high. Keeping your hips and shoulders forward, place one foot flat on the top of the bench. Maintain erect posture while pushing your hips forward until you feel the stretch in the front of your hip. Do not allow your front knee to go beyond your mid-foot. Repeat on your other side.



## 12. Hamstring Stretch



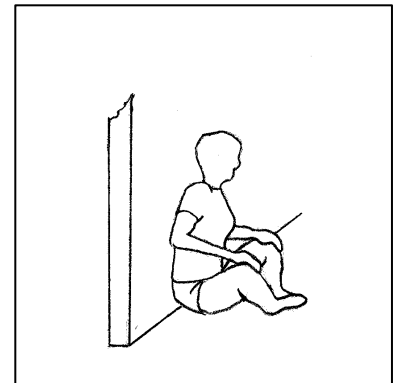
### **Stretches the muscles in the back of your thigh.**

Stand facing a sturdy bench approximately 2-3 feet high. Keeping your hips and shoulders straight, place one heel on the top of the bench. Maintain a flat back while hinging slightly forward at your hips until you feel the stretch. Do not bend at your waist.

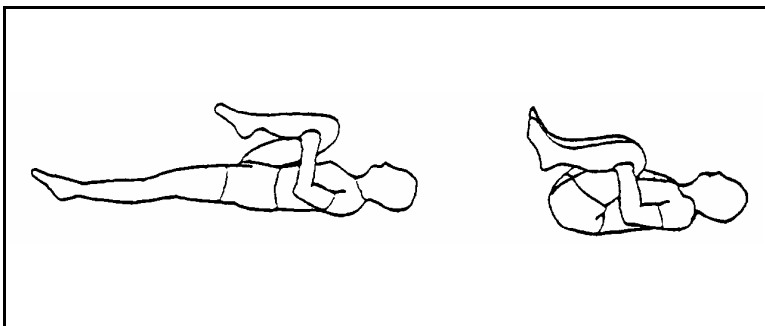
## 13. Groin Stretch

### **Stretches the muscles of your inner thighs and hips.**

Sit with your back flat against a wall. Bring the soles of your feet together and allow your knees to drop to the floor. Gently press your knees toward the floor with your hands.



## 14. Knee to Chest



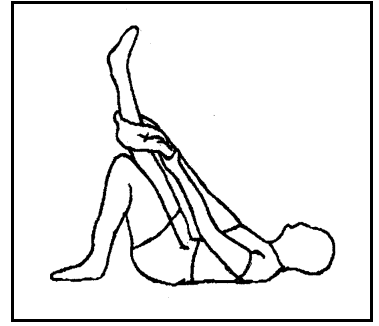
### **Stretches the muscles in your lower back and the back of your thighs.**

Lie on the floor on your back. Pull one knee toward your chest with your hands clasped behind your bent knee. Repeat with your other leg. Finally, pull both knees toward your chest.

## 15. Supine Leg Stretch

### **Stretches the muscles of the back of your thigh.**

Lie on the floor on your back with one leg bent and your foot flat on the floor and your other leg extended in the air. Wrap a towel behind the knee of your extended leg. Slowly pull your leg back toward your head. Repeat on your other side.



**CAUTION: When it comes to stretching, you should feel the stretching sensation in the muscle, NOT the joints. If you feel pain in the joints, check to be sure you are performing the stretch correctly. If after trying the stretch again, you still feel pain in the joints, avoid that stretch.**

## C. Calisthenics

Calisthenics are exercises that use body weight as the load or resistance. The exercise routine should be performed 3 to 4 times per week. To begin with, each exercise should be performed as many times as possible at a continuous, steady pace and that number repeated for each exercise during the first week. Thereafter, the number of repetitions for each exercise should be increased by at least the number indicated for each exercise below. Remember to use the form in the next section to keep a performance log.

The following calisthenics exercises are to be avoided because they create too much stress in certain joints. More effective calisthenics exercises are listed and explained in this section of the guide.

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### **DO NOT DO THESE CALISTHENICS EXERCISES**

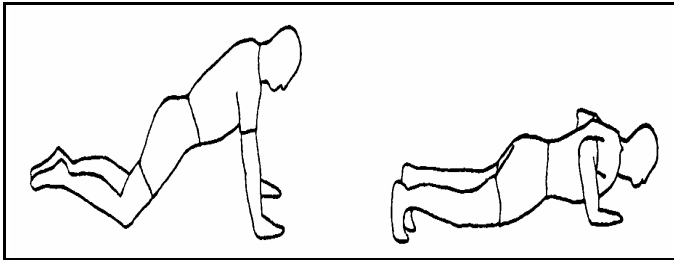
- Deep knee bends
- Double leg lifts (raising both legs while lying on your back)
- Straight leg sit-ups (sit-ups with straight legs)
- Toe-touches from a standing position (bending at waist and touching toes while keeping legs straight)

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### **Calisthenics Exercise Descriptions**

These exercises are listed in the suggested order of performance. Be sure to complete a warm-up period before doing these exercises.

#### 1. **Push-Ups**



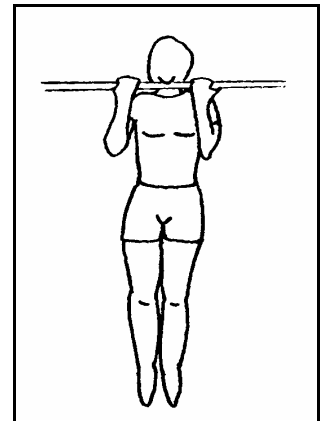
**For the chest, shoulder region and back of your upper arms.**

With your hands outside your shoulders, push up while keeping your back straight. Push-ups can be performed with your legs straight and your weight resting on your toes, or with your legs bent and your weight resting on your knees. Return until your chest almost touches the floor. Aim at increasing by at least 1 push-up per week.

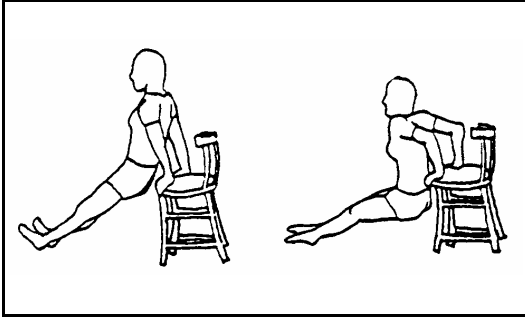
#### 2. **Chin-Ups**

**For the shoulder region and arm flexion.**

With an underhand grasp, raise your body until your chin is over the bar. Lower yourself as slowly as possible. Increase by at least 1 per week.



### 3. Dips



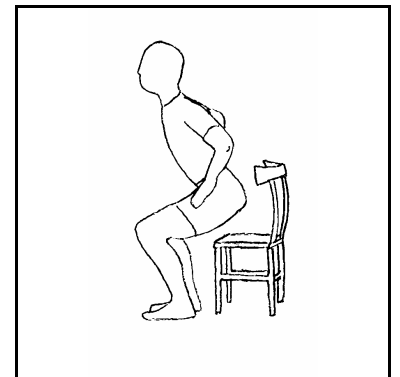
#### **For the muscles in your arms, shoulders and chest.**

Grasp the sides of a chair and let your feet slide forward while supporting your weight on your arms. Lower your body by bending your elbows to about 60 degrees and then push up to the starting position. Keep your body close to the chair. Increase by at least 1 per week.

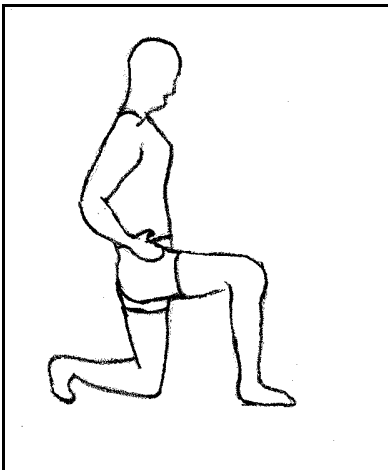
### 4. Chair Squats

#### **For the leg muscles.**

Stand about 6 inches in front of a chair, facing away from the chair. With your feet slightly wider than shoulder-width, move your hips back as you squat until your thighs are almost parallel to the ground, without sitting down on the chair. Your kneecaps should be aligned towards your second toe and your knees should not travel beyond the mid-foot. Hold for 1-2 seconds. Return to a standing position. Increase the number of squats by at least 1 per week, up to a maximum of 25. As an advanced exercise, the exercise can be done with a weight secured to the back, for example, a backpack.



### 5. Lunges and Forward Traveling Lunges



#### **For the leg muscles.**

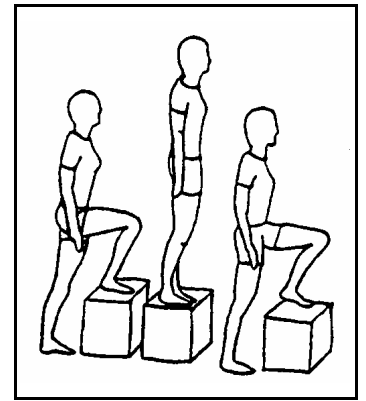
Stand with your feet hip-width apart in a stride position and your hands on your hips. Lower your body directly between your feet by bending your knees to approximately 90-degree angles. Press back up to the starting position. Perform the same number of lunges on the other side. Increase the number of lunges by at least 2 per week, up to a maximum of 25.

Variation: Step forward with your right foot and lower your body weight to a lunge position. Bend your knees to approximately 90-degree angles. Push through your hips and thighs in order to bring your left foot forward to meet your right foot. Continue to lunge, walking forward alternating feet.

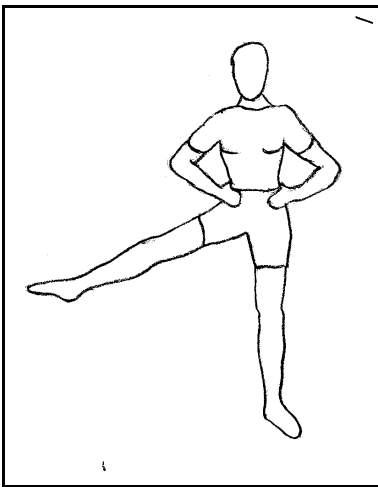
## 6. Bench Steps

### **For the leg muscles.**

Step up onto a bench that is 8-12" high, bringing up both of your feet and then down again, one foot at a time, for 30 seconds ("up-up-down-down"). Switch the lead foot and repeat for 30 seconds. Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.



## 7. Standing Side Leg Lifts



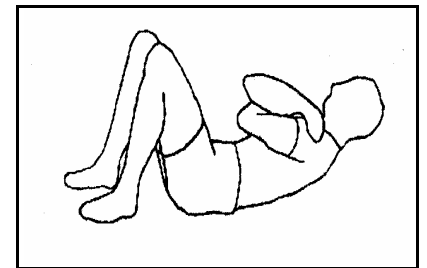
### **For your hip and outer thigh muscles.**

Stand with your feet shoulder-width apart and your hands on your hips. Transfer your body weight completely to your left leg. Keep your right leg straight and lift it directly to your side. Lower your right leg just short of your resting foot on the floor then lift again. Maintain an upright posture. Perform the same number of leg lifts on the other side. Increase the number of lifts by at least 2 per week, up to a maximum of 25 per side.

## 8. Curl-Ups

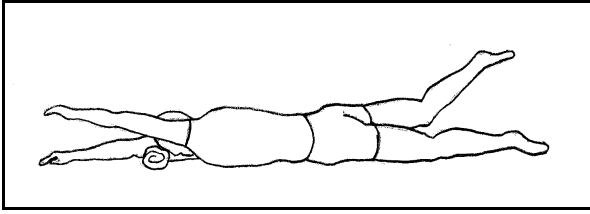
### **For the abdominal region.**

Lie face up on the floor with your legs bent and your heels approximately 8-12 inches from your buttocks. Using abdominal muscles, tilt your hips towards your ribcage as you raise your head and shoulders off of the floor pressing your lower back towards the floor. Your eyes should stay focused over your knees. Your hands and arms may be supporting your head, crossed over your chest, sliding up your legs or resting on the floor. Increase by at least 2 per week.





## 9. Opposite Arm and Leg Lifts



**For the muscles in your back, buttocks and the back of your legs.**

Lie face down on the floor with your forehead resting on a towel. Your arms should be stretched overhead with your hands shoulder-width apart. Raise your left arm and your right leg approximately 4-8 inches from the floor. Lower your arm and leg to the starting position. Repeat on the other side. Increase by at least 1 per week, up to a maximum of 15 raises per side.

## 10. Hand-Grip Strength

**For your finger, hand and forearm muscles.**

Use a rubber ball or any commercially available spring loaded hand grip device. Grip and squeeze the ball with one hand 8 times and then alternate to your other hand and grip and squeeze 8 times. Repeat the sequence 4 times for each hand. Increase the number of squeezes per hand by 2 each week while keeping the number of sequences for each hand at 4.

### D. Weight Training

Weight training is one method by which an overload can be applied to a muscle or muscle group in order to improve muscular endurance and strength. The weight training program provided in this section of the guide is intended to exercise all the major muscle groups. A progressive training program that extends up to 12 weeks is presented in the table on the next page. The table includes the following terms:

**Load:** Refers to the number of pounds of resistance lifted or moved.

**Repetitions:** Refers to the number of consecutive times the exercise is done without interruption or rest, "reps."

**Set:** One set equals the number of repetitions performed for one exercise. If the recommendation is for 3 sets, then 3 groups of "reps" are to be done in the exercise session. It would also be described as one round of all the different exercises, should the "reps" for an exercise not be done consecutively.

The weight training exercises that are recommended for this program can be performed through the combined use of free weights and weight machines, or through the use of a weight machine. Two exercises (i.e., curl-ups and bench steps from the calisthenics program) that have body weight as the load instead of external weights are included in this training program to ensure that all relevant muscle groups are exercised.

The recommended initial load (IL) is given at the end of each exercise description. If you cannot move the recommended initial load or cannot complete the 4 repetitions to start your program, reduce the recommended initial load by increments of 5 lbs. until you are able to complete 4 consecutive repetitions. Record the initial load used for each exercise on your log page.

If, on the other hand, the recommended initial load does not appear to stress you for the beginning 4 repetitions, then add increments of 5 lbs. until you feel that the load represents an overload for that muscle group. Another way of determining the initial load is to use the maximum load you can move once in a specific exercise. Use 80% of that maximum load as the initial load for that exercise. If you use the latter method to determine your initial load, it is extremely important that you have another person there to assist you. In fact, it is a good idea to have another person assist you in the determination of your initial load, or on the first day of training, regardless of the way you determine the initial load for each exercise.

<b>PROGRESSIVE WEIGHT TRAINING PROGRAM</b>			
<b>Week</b>	<b>Load</b>	<b>Repetitions</b>	<b>Sets</b>
1	Initial Load (IL)	4	3
2	IL	6	3
3	IL	8	3
4	IL + 5lb	4	3
5	IL + 5lb	6	3
6	IL + 5lb	8	3
7	IL + 10lb	4	3
8	IL + 10lb	6	3
9	IL + 10lb	8	3
10	IL + 15 - 20lb	4	3
11	IL + 15 - 20lb	6	3
12	IL + 15 - 20lb	8	3

## Weight Training Exercise Descriptions

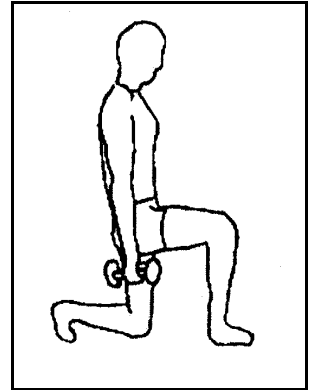
These exercises are listed in the suggested order of performance. This program should be performed 3 times per week. Keep a log of the loads and number of repetitions. Be sure to complete a warm-up period prior to weight training.

### 1. Lunges and Forward Traveling Lunges

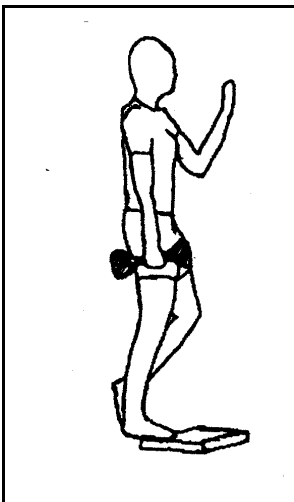
#### **For the leg muscles.**

Stand with your feet hip-width apart in a stride position. Hold dumbbells next to your body or rest a weight bar on your shoulders behind your neck with the palms of your hands facing forward and spread far apart on the bar. Lower your body directly between your feet by bending your knees to approximately 90-degree angles. Press back up to the starting position. Perform the same number of lunges on the other side. Suggested initial load: 1/4 of your body weight.

Variation: Hold dumbbells next to your body or rest a weight bar on your shoulders behind your neck with the palms of your hands facing forward and spread far apart on the bar. Step forward with your right foot and lower your body weight to a lunge position. Bend your knees to approximately 90-degree angles. Push through your hips and thighs in order to bring your left foot forward to meet your right foot. Continue lunge walking forward alternating feet.



### 2. Toe Raises



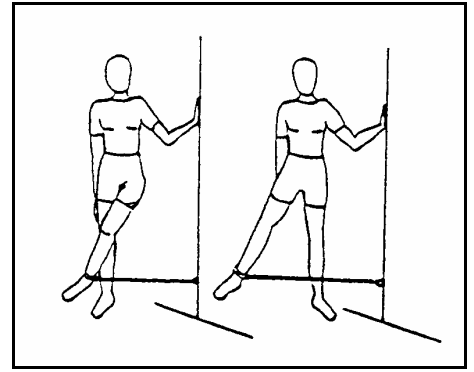
#### **For the muscles in the back of your lower leg.**

Stand on a platform at least 4 inches high on your right leg and hold a dumbbell in your right hand. Balance yourself with your left hand. Keeping your right knee straight, raise upward on the ball of your right foot as high as possible then slowly lower your heel towards the floor. Do not stretch down as far as possible. Repeat on other side. Suggested initial load: 1/8 of your body weight.

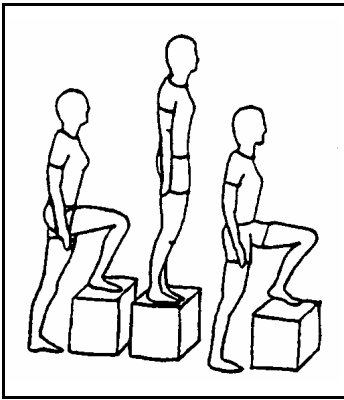
### 3. Side Leg Raises

#### **For your hip and thigh muscles.**

Standing with your side to the pulley at a pulley station and holding the frame of the pulley system with one hand, hook the ankle of your outside leg to the pulley. With your knee slightly bent, move your leg to the side, as far as possible, and then return to the starting position. After completing a set, hook the ankle of your inside leg to the pulley. With your knee straight, move your leg in front of your other leg as far to the side as possible and complete a set. Turn around and repeat the exercises with your opposite leg. Suggested initial load: 1/4 of your body weight.



### 4. Bench Steps



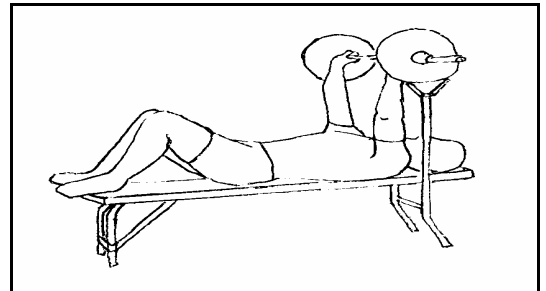
#### **For your leg muscles.**

Step up onto a bench 8-12" high, bringing up both feet and then down again, one foot at a time, for 30 seconds ("up-up-down-down"). Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.

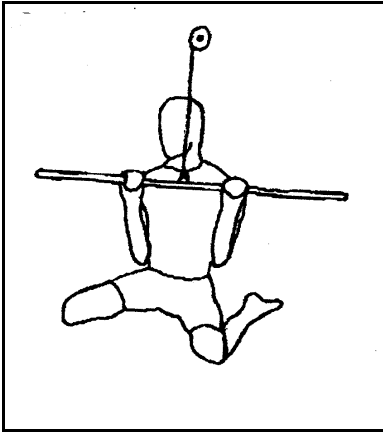
### 5. Bench Press

#### **For the muscles in your shoulder, chest and arms.**

Lie on your back on a bench with your feet on the bench. Hold the bar above your chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to approximately 1 inch above your chest and then return it to the starting position. Suggested initial load: 1/3 of your body weight.



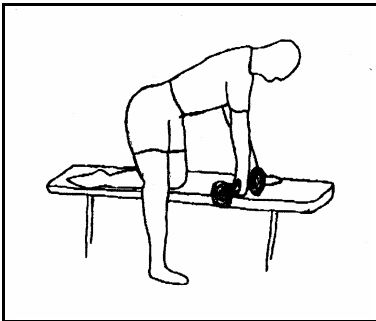
## 6. Lateral Pull-Downs



### **For the muscles in your upper and mid-back.**

Grip the bar with the palms of your hands forward hands slightly wider than shoulder-width apart. Start from a sitting position or kneeling position on the floor with your arms stretched overhead. Lean your body back slightly. Pull the bar towards your chest. It is not necessary to touch your chest. Return to the starting position. Suggested initial load: 1/3 of your body weight.

## 7. Bent Over Row



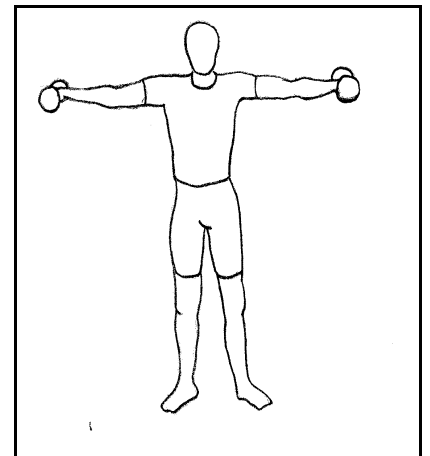
### **For the muscles in your upper and mid-back.**

Stand next to a bench with your left hand and left knee on the top of the bench. Maintain flat back position. Grasp a dumbbell in your right hand. Pull your right elbow towards the ceiling brushing your right forearm by your ribcage. Slowly return to the starting position. Repeat on the other side. Suggested initial load: 1/8 of your body weight.

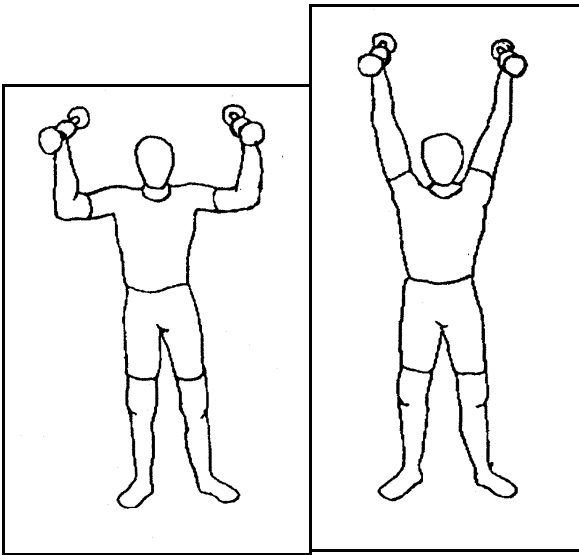
## 8. Lateral Raises

### **For your shoulders.**

Stand erect with your feet shoulder-width apart and your knees slightly bent. Hold dumbbells slightly forward of your thighs. Maintain a slight bend in your elbow as you raise your arms to shoulder level. Your hands should remain in peripheral vision. Slowly return to the starting position. Suggested initial load: 1/20 of your body weight.



## 9. Overhead Press



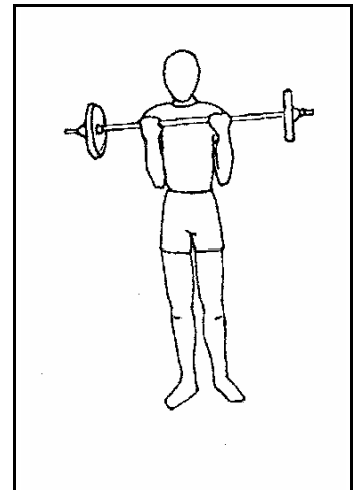
### **For the muscles in your shoulders.**

Sit or stand erect with your feet shoulder-width apart. Hold dumbbells with the palms of your hands facing your ears, your hands should be positioned directly over your elbows. Push the dumbbells straight up to an overhead position until your arms are straight and then lower the dumbbells in a controlled manner to the starting position. Do not arch your back. Suggested initial load: 1/4 of your body weight.

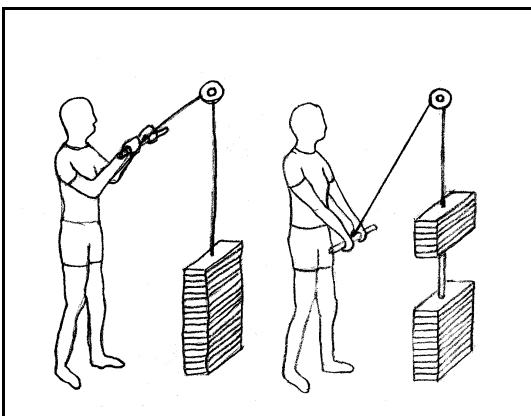
## 10. Arm Curls

### **For the muscles that bend your elbow.**

Standing with your elbows straight and in front of your thighs, hold a weight bar with an underhand grip, hands shoulder-width apart. Keeping your elbows close to your sides, bend your elbows and raise the bar to your chest, then slowly lower the bar to the starting position. Do not lean backward while raising the bar or forward when lowering it. Suggested initial load: 1/4 of your body weight.



## 11. Triceps Push-Down



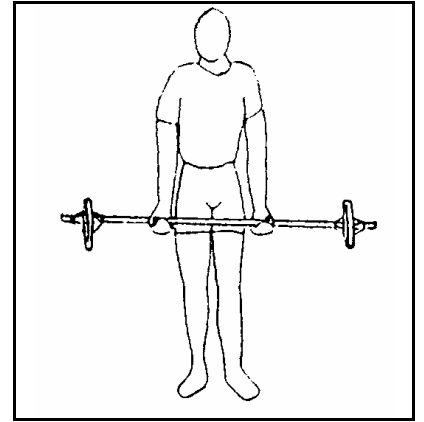
### **For the muscles that extend your elbow.**

Attach a bar to the top pulley at a pulley station. Stand with your feet shoulder-width apart one foot in front of the other and your knees slightly bent. Grasp the bar with the palms of your hands forward and shoulder-width apart. Pull the bar down so that your elbows are next to but not touching your ribcage. Straighten your elbows pressing the bar down towards your thighs and then return to the starting position. Suggested initial load: 1/3 of your body weight.

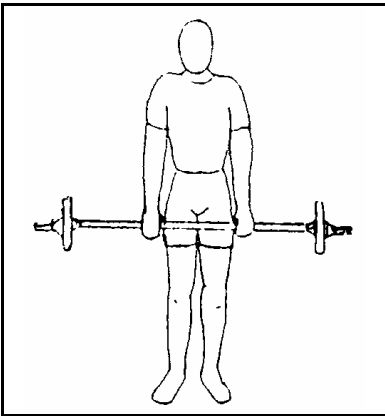
## 12. Wrist Curls

### **For the muscles that bend your wrist.**

Standing with your elbows straight and in front of your thighs, hold a weight bar with an underhand grip, hands shoulder-width apart. Keeping your elbows close to your sides, curl your wrists to raise the bar, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of your body weight.



## 13. Reverse Wrist Curls



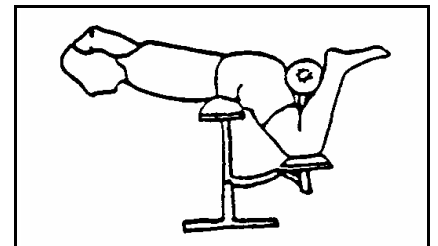
### **For the muscles that extend your wrist.**

Standing with your elbows straight and in front of your thighs, hold a weight bar with an overhand grip, hands shoulder-width apart. Keeping your elbows close to your sides, extend your wrists to raise the bar, then slowly lower the bar to the starting position. Suggested initial load: 1/4 of your body weight.

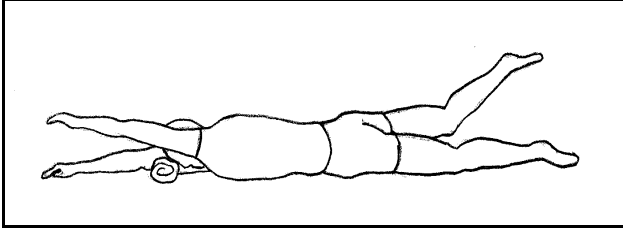
## 14. Trunk Lifts

### **For the muscles in your back, buttocks and the back of your legs.**

Lie on your abdomen, with your trunk unsupported over the edge of a trunk lift station support, and bend so that your trunk is nearly perpendicular to the ground. With your hands locked behind your head, slowly lift your trunk and head so that your back is parallel to the ground and then return to the starting position. Suggested initial load: 5 lifts. Increase the number of lifts by at least 1 per week, up to a maximum of 15.



## 15. Opposite Arm and Leg Lifts



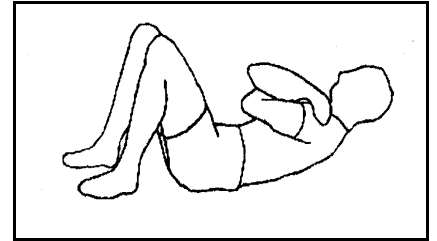
**For the muscles in your back, buttocks and the back of your legs.**

Lie face down on the floor with your forehead resting on a towel. Your arms should be stretched overhead with your hands shoulder-width apart. Raise your left arm and your right leg approximately 4-8 inches from the floor. Lower to the starting position. Repeat on other side. Increase by at least 1 raise per week, up to a maximum of 15 raises per side.

## 16. Curl-Ups

**For your abdominal region.**

Lie face up on the floor with your legs bent and heels approximately 8-12 inches from your buttocks. Using your abdominal muscles, tilt your hips towards your ribcage as you raise your head and shoulders off of the floor pressing your lower back towards the floor. Eyes should stay focused over your knees. Your hands and arms may be supporting your head, crossed over your chest, sliding up your legs as you raise off of the floor or resting on the floor. Increase by at least 2 per week.





## E. Aerobic Training Program

The aerobic training program is designed to develop cardiovascular endurance as well as muscular endurance in the legs. The running and stair climbing programs should be done 3 times per week, or as indicated in the Progressive Running Program table below.

### Exercise Descriptions

#### 1. Running Program

Significant improvements in aerobic conditioning should be evident after 10-12 weeks of training. The following program is designed with a progression that extends up to 12 weeks. If you continue to train for longer periods, you should continue to progressively increase the distance while maintaining the intensity at 7-8 minutes per mile. Start the program by walking, then walk and run, or run, as necessary to meet the changing time goals.

<b>PROGRESSIVE RUNNING PROGRAM</b>			
<b>Week</b>	<b>Distance (Miles)</b>	<b>Time Goal (minutes:seconds)</b>	<b>Times Per Week</b>
1	2.0	30:30	3
2	2.0	27:00	3
3	2.0	26:00	3
4	2.0	25:00	3
5	2.0	24:00	3
6	2.0	22:00	3
7	2.0	19:00	3
8	2.0	18:00	4
9	2.0	17:00	4
10	2.5	22:00	3
11	2.5	21:30	4
12	3.0	26:30	4

## **2. Stair Run**

Keeping a moderate but steady pace, run up stairs to the second floor from where you start (for example, from the first to the third floor) and then run back down the stairs to the level from which you started. Repeat as many times as you can without resting, and count each round trip you can run while keeping the same steady pace. For the first week, run as many round trips as were done on the first day and record the amount of time you kept moving on the stairs. Increase the number of round trips by 1 per week, up to a maximum duration of 10 minutes of running up and down the stairs. Thereafter, try to increase the number of round trips you make during the 10 minutes. The stair climbing program is designed to develop cardiovascular endurance as well as muscular endurance in the legs. The stair climbing program should be done 3 times per week.

### **F. Cool-Down**

The cool-down session should be performed for 5 to 10 minutes at the end of each exercise period. The purpose of this phase of the program is to gradually decrease the heart rate, to continue adequate blood circulation, and to decrease the chance that dizziness, nausea or other problems may follow the exercise session.

After you complete an aerobic training session, begin to jog, then walk rapidly for a total of about 5 minutes. Continue with moderate walking. Afterward, do the following stretching exercises. Descriptions of these stretches can be found in the Warm-up section of this guide.

- Hamstring Stretch
- Supine Leg Stretch
- Stride Stretch
- Wall Lean
- Shoulder Stretch
- Arm Circles

If your work-out session consisted of only the strength and muscular endurance exercises, walk at a moderate pace for a few minutes and then perform the stretches listed above from the Warm-up section of this Guide.

## SECTION IV: WEEKLY LOG PAGES

### A. Weekly Log: Calisthenics and Aerobic Exercises

Training Week Number: \_\_\_\_\_

Date of Session 1: \_\_\_\_\_

Body Weight: \_\_\_\_\_

Date of Session 2: \_\_\_\_\_

Body Weight: \_\_\_\_\_

Date of Session 3: \_\_\_\_\_

Body Weight: \_\_\_\_\_

Date of Session 4: \_\_\_\_\_

Body Weight: \_\_\_\_\_

Exercise		Session 1	Session 2	Session 3	Session 4												
<b>CALISTENICS TRAINING EXERCISES</b>																	
Push-Ups	# of reps																
Chin-Ups	# of reps																
Dips	# of reps																
Chair Squats (max=25 reps)	# of reps																
Lunges (max=25 reps)	# of reps																
Bench Steps (max=60 sec)	time																
Standing Side Leg Lifts (max=25 reps)	# of reps																
Curl-Ups	# of reps																
Opposite Arm and Leg Lifts (max=15 reps)	# of reps																
Hand-Grip Strength (4 sequences)	# of reps																
<b>AEROBIC TRAINING EXERCISES</b>																	
Running Program	distance																
	time																
Stair Run (max=10 min)	# of trips																
	time																

## B. Weekly Log: Weight Training and Aerobic Exercises

Training Week Number: \_\_\_\_\_

Date of Session 1: \_\_\_\_\_ Body Weight: \_\_\_\_\_

Date of Session 2: \_\_\_\_\_ Body Weight: \_\_\_\_\_

Date of Session 3: \_\_\_\_\_ Body Weight: \_\_\_\_\_

Date of Session 4: \_\_\_\_\_ Body Weight: \_\_\_\_\_

Workout Session	Session 1			Session 2			Session 3			Session 4			
Set	1	2	3	1	2	3	1	2	3	1	2	3	
<b>WEIGHT TRAINING EXERCISES</b>													
Lunges\Forward Traveling Lunges	# of reps												
	load (lbs.)												
Toe Raises	# of reps												
	load (lbs.)												
Side Leg Raises	# of reps												
	load (lbs.)												
Bench Steps (max=60 sec)	time (sec)												
Bench Press	# of reps												
	load (lbs.)												
Lateral Pull-Downs	# of reps												
	load (lbs.)												
Bent Over Row	# of reps												
	load (lbs.)												
Lateral Raises	# of reps												
	load (lbs.)												
Overhead Press	# of reps												
	load (lbs.)												
Arm Curls	# of reps												
	load (lbs.)												
Triceps Push-Down	# of reps												
	load (lbs.)												
Wrist Curls	# of reps												
	load (lbs.)												
Reverse Wrist Curls	# of reps												
	load (lbs.)												
Trunk Lifts (max=15 reps)	# of lifts												
Opposite Arm/Leg Lifts (max=15 reps)	# of raises												
Curl-Ups	# of reps												
<b>AEROBIC TRAINING EXERCISES</b>													
Running Program	distance												
	time												
Stair Run (max=10 min)	# of trips												
	time												

## SECTION V: REFERENCES USED IN THE PAT SECTION OF THIS GUIDE

The following sources were used as references in the development of the fitness program presented in this Guide.

1. American College of Sports Medicine. Fitness Book. Champaign, IL: Leisure Press, 1992.
2. American College of Sports Medicine. Guidelines for Exercise Testing and Prescription. Fifth Edition. Baltimore: Williams and Wilkins, 1995.
3. Cooper, K. H. The Aerobics Way. New York: M. Evans Co., 1977.
4. Heyward, Vivian H. Designs for Fitness. Minneapolis: Burgess Publishing Co., 1984.
5. Howley, Edward T. & B. Don Franks. Health/Fitness Instructor's Handbook. Champaign, IL: Human Kinetics Publishers, 1986.
6. Sharkey, Brian J. Physiology of Fitness. Champaign, IL: Human Kinetics Publishers, 1979.
7. Reid, J. Gavin & John M. Thomson. Exercise Prescription for Fitness. Englewood Cliffs, NJ: Prentice Hall, Inc., 1985.

## **FINAL WORDS**

This Guide is designed to familiarize you with the Physical Ability Test simulations and logistics and to provide you with a health and fitness training program to help you prepare for this test. The suggestions provided here are not exhaustive - - we encourage you to engage in whatever additional preparation strategies you believe will enhance your chances of performing effectively on the Physical Ability Test and on the job.