# CANDIDATE PREPARATION GUIDE FOR THE TULSA ENTRY LEVEL FIREFIGHTER EXAMINATION

## PHYSICAL ABILITY TEST

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## PHYSICAL ABILITY TEST

This guide contains a physical conditioning program intended to assist you in preparing for the Physical Ability Test. It is divided into four major sections as follows:

**Section I:** **Preparing to Begin a Fitness Program** first discusses health factors that may effect your ability to perform the fitness program and the Physical Ability Test. This section also discusses principles of training, and provides instructions for assessing your current level of fitness.

**Section II:** Presents a **Fitness Program** designed for a sixteen week training period. The program includes warm-up exercises, calisthenics, weight training, aerobic training and cool down exercises.

**Section III:** **Weekly Log Pages** are provided so that you can track your progress.

**Section IV:** Gives a **Summary of the Physical Ability Test and Description of Exercise Training Program**. In addition, Section IV applies each event on the PAT, to the tasks of a firefighter, and reiterates the exercises associated with that event.

**Section V:** Lists **References** that were used to develop the physical conditioning program. You can look for these reference sources if you would like further information about physical fitness.

## SECTION I: PREPARING TO BEGIN A FITNESS PROGRAM

### A. Medical and General Health Factors

#### Health Screening for Physical Activity

To optimize your safety during both the Physical Ability Testing (PAT) and exercise training in preparation for the PAT, some initial screening for important medical and health factors is necessary. The purposes for this type of pre-participation screening include:

- identifying those individuals who have medical conditions serious enough that exercise would either present an immediate risk or aggravate the medical problem,
- identifying those individuals who have either signs and symptoms which suggest a problem or risk factors for diseases who should receive further medical evaluation before undergoing exercise training or a PAT, and
- identifying those individuals 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 unnecessary for everyone to get a thorough physical examination from a physician prior to starting an exercise 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 an exercise program, by all means do so.

The Physical Activity Readiness Questionnaire (PAR-Q) is recommended as a minimal standard for screening prior to beginning an exercise program or, if some activity is already underway, 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.

## Physical Activity Readiness Questionnaire (PAR-Q)[1]

| | | | |
|---|---|---|---|
| 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 over 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 against your exercising without medical supervision? | YES | NO |

**If you answered YES to any of these 7 questions, vigorous exercise and exercise testing should be postponed until medical clearance is obtained.**

Question number 7 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 table below 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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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.

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 exercise testing should be postponed until medical clearance is obtained.**

2. Major Heart Disease Risk Factors:

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

   **If you have <u>two or more</u> of these risk factors, vigorous exercise or exercise 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 an exercise program.**

4. It is also recommended that men over the age of 40 and women over the age of 50 have a physical exam prior to beginning a vigorous exercise 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 exercise 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 make it wise to get 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 an exercise program if they have not been physically active prior to the pregnancy.

## 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, especially while carrying equipment. 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 Physical Ability Test, applicants who smoke are urged to quit smoking as soon as possible.

## Weight Control

Carrying excess weight in the form of fat will reduce an applicant's performance potential on the Physical Ability Test. 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 result ranging from pulled leg muscles to a heart attack.

In an effort to promote safety and optimal health, it is recommended that overweight applicants try to lose weight before participating in the Physical Ability Test. To best accomplish this, overweight applicants should begin a weight reduction program that contains both a 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 may be making, 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 calorie 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 calorie intake, look at the following 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 one week and 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 of weight per week, you can cut calories by 500 and increase exercise by 500 calories. 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:

**Ways to Burn 500 Calories**

- 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 the appropriate foods. Our first aim is to identify the foods you're currently eating that are too high in fat. Some examples might include:

- 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, most Americans are simply eating 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 on fat as much as possible.

Your next step is to assess how many fruits and vegetables you're eating. The recommended number of fruits is 2-4 pieces per day (or 2-4 cups of canned fruit in it's 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:

- 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 kept to a minimum, to the surprise of many people. In fact, 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, no fat yogurt, and lower fat cheese such as mozzarella.

An example of a high carbohydrate, low fat eating plan that can be adapted to your desired caloric intake appears next.

**The following is an example of a high carbohydrate, low fat Eating Plan:**

| **Breakfast** |
| --- |
| 1-2 cups of cereal (a high fiber one is best, but any will do)<br>1 cup of skim milk<br>1 piece of fruit (any kind)<br>1-2 slices of toast or a bagel or English muffin with jam or jelly (no fat) |
| **Snack** |
| 1 piece of fruit (any kind) |
| **Lunch** |
| 1 sandwich made with:<br>2 slices whole wheat bread,<br>3 - 4 ounces of turkey,<br>chicken or fish<br>mustard and no mayo<br>tomatoes, lettuce, pickles<br><br>a bag of raw vegetables including carrots, celery, broccoli, cauliflower<br>1 piece of fruit (any kind)<br>1 cup of low fat or no-fat yogurt<br>1 small bag of pretzels<br>a non-caloric beverage of choice, or water |
| **Snack** |
| pretzels (small bag), fruit, vegetables, or yogurt |
| **Dinner** |
| 5-6 ounces of meat of your choice<br>a potato or 2 cups of rice or 2 cups of pasta or 2 slices of bread<br>any amount of vegetables without butter or margarine on them<br>1 piece of fruit<br>8 ounces of skim milk or 8 ounces of non-fat yogurt |
| Additional calories may be obtained from other low fat sources. |

## Meal Planning

Always eat three regular size meals as shown in the example Eating Plan, or six small meals every day. The purpose behind this advice is twofold. First, you spread your calories out throughout the day allowing adequate blood sugar for energy. Second, by eating periodically, you are never "starving." By withholding calories as in 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 actually 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, for a while 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'll 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 the lost weight back. So concentrate on changing a 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. But, 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.

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 (1-2 lbs. per week) goals 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.

## Terms

Some of the terms used in this training program are explained below, as are some of the principles upon which this training 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 training program is designed to develop all components of fitness because of their role in the PAT events 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 Preparation 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 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 muscular 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 in the same way they are used in that activity.

**One especially important use of training specificity for firefighters is stairclimbing. In particular, climbing down stairs involves an action which stretches (rather than contracts) the leg muscles. This may cause muscle tissue damage which leads to muscle soreness - probably more so than any other activity! Training which specifically involves stairclimbing (up and down, repetitively) will decrease potential for muscle soreness and related problems.**

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 high level 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 training 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 the individual to:

- Mentally prepare for exercise.
- Increase body temperature slowly.
- Stretch the muscles and joints, and
- 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

Muscles 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 training. They may cause injury if they fall on a person or if undue strain occurs in trying to control the weight (for example, to keep it from falling). This can happen as a result of the 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.

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

- It allows 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 a fitness program, to determine your current level of fitness. Also, take the test at several intervals in your training period before the Physical Ability Test to measure your progress.

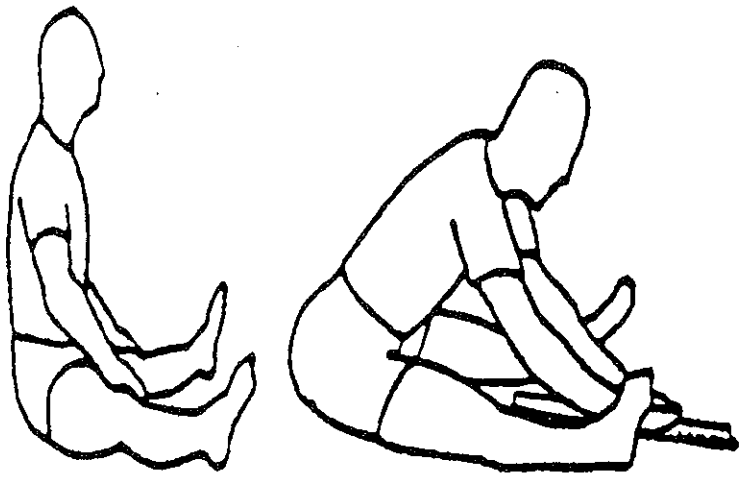
The events described in the fitness test are related to the four areas of fitness. A sit and reach test measures flexibility. Curl-ups, push-ups, a flexed arm hang, dips and a jump and reach test measure muscular strength and endurance. A 1.5-mile run measures cardiorespiratory fitness.

Keep a record of your results each time you complete the test. Do not be concerned about how your results compare to national standards. Use your results to monitor your progress, to provide motivation, to establish goals, and to determine the effectiveness of your training program.

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

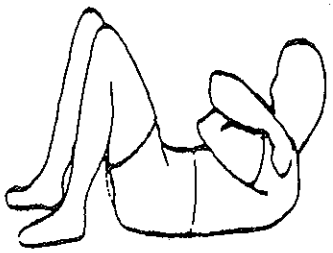
- Yard stick and some masking tape
- Stop watch
- High bar to hang from (about 3/4 inch in diameter)
- Newspaper
- 12 inch high step
- 1.5 mile measured distance (a high school track or measured running path)
- Scale to measure body weight
- Score Sheet (included at the end of this section)

1. **Sit-and-Reach**

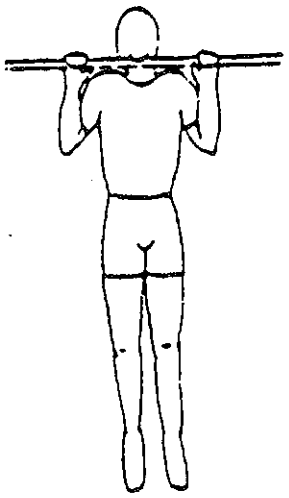


Tape a yard stick to the floor at the 15-inch mark. Sit on the floor with the yardstick between your legs and the zero mark on the yardstick toward you. Keep your legs straight and place your heels even with the 15-inch mark on the yard stick. Place your hands in front of you, one over the other. Slowly 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, to the nearest inch, you can reach in 3 tries.

2. **Curl-ups**



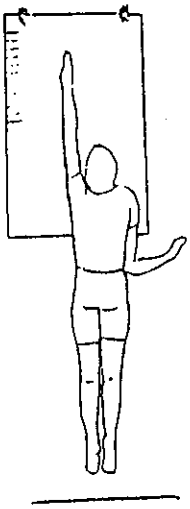
Lie face up on the floor with legs bent and lower back flat against floor. Using abdominal muscles, pull head and shoulders off of floor while looking up. Hands and arms may be crossed over chest, supporting head, on floor or sliding up legs. Record the number of curl-ups completed. You need not go all the way up, merely lift the shoulders and upper back off the floor.



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

**4. <u>Push Ups</u>**

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



Tape a piece of newspaper to the wall above your head. Using the yard stick, make marks on the newspaper at one-inch intervals. Dip the fingers of your dominant hand into some 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. <u>1.5 Mile Run</u>**

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.

| | Test 1 | Test 2 | Test 3 |
|---|---|---|---|
| **FLEXIBILITY** | | | |
| Sit-and-Reach | Distance: | Distance: | Distance: |
| **MUSCULAR - STRENGTH AND ENDURANCE** | | | |
| Curl-ups | No. | No. | No. |
| Flexed-arm hang | Time: | Time: | Time: |
| Push-ups | No. | No. | No. |
| Jump and Reach | Height: | Height: | Height: |
| **CARDIOVASCULAR** | | | |
| 1.5 Mile Run | Time: | Time: | Time: |

1. Date of first test: _____ Weight: _____
2. Date of second test: _____ Weight: _____
3. Date of third test: _____ Weight: _____

## A: General Directions for Fitness Program

The fitness program is divided into the following sections:

- Warm-up
- Strength and muscular endurance exercises
- Aerobic 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 aerobics program. In other words, 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 aerobics program, warm-up and cool-down exercises should be performed before and after each of the two exercise sessions.

The warm-up exercises are designed not only to get a person physically and mentally ready for the muscular and/or aerobics exercise sessions, 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 a program has begun using a particular method for strength and muscular endurance exercises, it should be continued for the duration of the training period for comparative purposes.

Since there are no equipment requirements for the aerobics training, the same program can and should be followed by everyone regardless of the particular program (i.e., calisthenics vs. weight training) chosen to develop strength and muscular endurance. A weekly log sheet is provided so that applicants 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, applicants should use the log sheet that is designed for the particular exercise program they've chosen to follow. Copies of the log sheet will have to be made for each week of the training program.

### Training for the Physical Ability Test

The stretching exercises have been selected to help develop flexibility in the major joints of the body. Although flexibility will be of particular importance in those events that involve performing an activity within a confined space or under conditions that confine movement, it will play a role in all test events.

Appropriate preparation for the Physical Ability Test also will require the development of strength and endurance in the muscle groups that will be used when performing the test events. Muscle strength will be particularly important to those events that require a single application of force such as dragging a victim over a distance. Both muscle strength and muscular endurance will be important to those activities that involve maintaining a force or the repeated application of a force over a period of time such as running the obstacle course. Like flexibility, muscular endurance also will be important to performance on the test as a whole, since there will be repeated instances, across events, in which force will need to be applied. Once again, an exercise program that consists of calisthenics or weight training can be used to develop in these areas.

involve continuous activity over an extended period of time, such as climbing stairs, as well as to endure through the entire series of test events. As previously mentioned, the aerobic demands of stair climbing are very specific. Training for the Physical Ability Test should include this particular aerobic activity on a regular basis.

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

## B: Warm-up Exercises

The warm-up period should last 5-10 minutes. The whole set 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-ups should be performed before each separate exercise session.

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

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

---

**DO NOT DO THESE EXERCISES**

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

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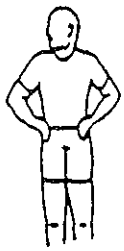
**Exercise Descriptions**

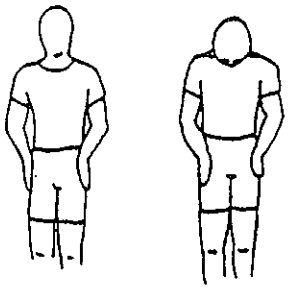
**The following stretches are effective for improving flexibility in each muscle group. Begin your warm-up period by performing light aerobic activity, such as marching or jogging in place and arm circles.**



**Stretches neck muscles**

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

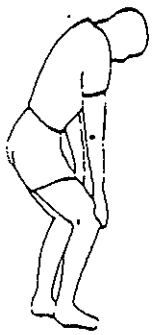
2. FORWARD AND DOWN LOOK



**Stretches neck muscles.**

Slowly look downward. Don't place chin on chest.

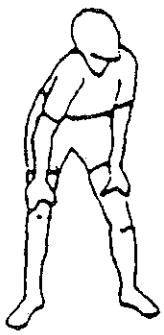
3. STANDING CAT STRETCH



**Stretches lower back and back of upper legs.**

Stand with legs shoulder-width apart, keeping knees bent. Lean over and place hands just above knees. Keep back straight and flat. Then arch back up, pulling in with abdominals and curling head and neck under. Return to flat back position. Do not arch back down past the 'flat back' position when returning to starting position.

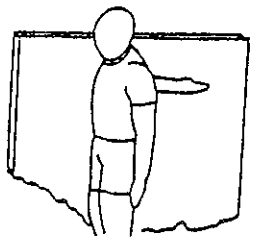
**Stretches lower back and back of upper legs.**



Stand with feet shoulder width apart. Keeping knees bent, lean over and place hands just above knees. With back straight and flat, gently press left shoulder downward and bring right shoulder upward on a smooth twisting motion. Repeat on other side.

5. CHEST STRETCH

**Stretches the chest muscles.**

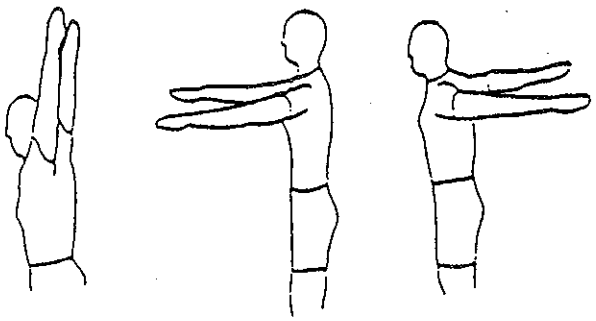


Stand next to a wall. Extend arm back along wall and press shoulder toward wall. Repeat on other side.

6. SHOULDER STRETCH

**Stretches the shoulder and upper back muscles.**

Stand up straight with feet shoulder-width apart. Reach right hand across body to left shoulder. Use left hand to hold arm. Place left hand on back of right arm just above the elbow. Pull through with muscles of right arm and shoulder. Do not push on elbow. Repeat on other side.



**Stretches the chest and shoulder muscles.**

Standing with feet apart, perform slow, full-arm circles backward 5 to 10 times, then forward the same number of times. The arms should brush past the ears and the sides of the trunk.

8. FINGER EXTENSION-FLEXION

**Stretches your finger muscles.**

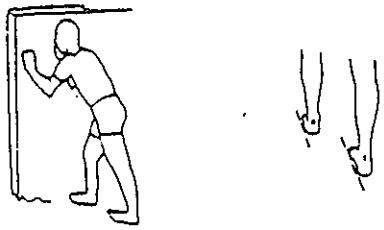
Stand with arms stretched in front, feet slightly apart and palms facing the floor. Begin by extending your fingers to the open hand position. Bring fingers together in a fist and repeat the motion of opening your hand to extend your fingers. Exercise both hands simultaneously. Perform this exercise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

9. SIDE STRETCH OR REACH

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

With feet shoulder-width apart, place one hand on the hip and extend the other arm overhead. Look up past your fingertips. Reach straight up with raised hand until you feel a stretch up your side. Reposition the arms and do the same on the other side.

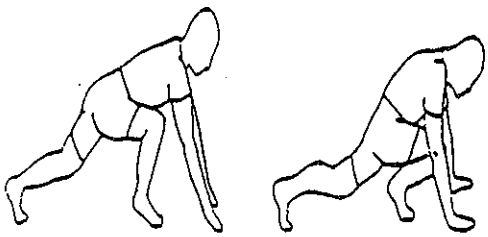
**Stretches the muscles in the back of the lower legs (the calves).**



Stand about 3 feet from a wall, feet slightly apart and put both hands on the wall. Place one foot slightly in front of the other. Keep back heel on the ground and turned slightly inward. Keeping back leg straight, lean forward slowly and feel the stretch in the calf. Repeat for other side.

11. STRIDE STRETCH

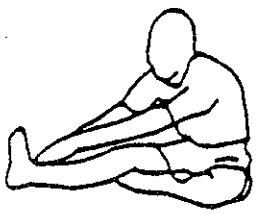
**Stretches the thigh muscles.**



Slowly slide into a stride position with the front foot almost flat on the floor, and the rear foot on the toes. Put the hands on the floor for balance. Lean forward while pushing the hips downward. Keep front knee in line with toes of front foot. Repeat on the opposite side.

12. MODIFIED HURDLER

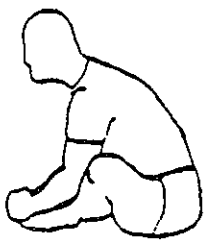
**Stretches muscles in the back and the back of the legs.**



In a seated position, extend right leg on floor. Bend left leg, placing left foot against the inside of your right thigh. Slowly slide your hands down your right leg until you feel the stretch.

13. TOE PULL

**Stretches inner thighs, front of legs and hip muscles.**



In a seated position, pull knees toward chest. Let your knees drop to the floor as you pull the soles of your feet together. Pull feet toward you while pressing knees toward floor with elbows.

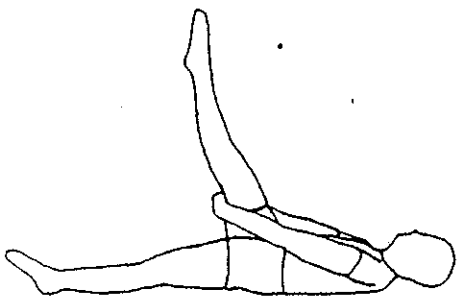
**Stretches the muscles in the lower back and the back of the**

**thighs.**

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

15. SUPINE LEG STRETCH

**Stretches the muscles of the back of the thighs.**



Lie on the floor on your back with one leg extended on the floor and the other extended in the air. Grasp your hands behind the thigh of the leg that is extended in the air. Slowly pull the leg back toward your head. Hold and repeat on 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 using the correct position to do the exercise, reposition yourself as necessary, and try again. If you still feel pain in the joints, avoid that exercise.***

Calisthenics are exercises that use body weight as the load or resistance. The following exercises were selected in order to increase the strength and muscular endurance in the muscle groups that will be utilized in the Physical Ability Test. 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 in each exercise below. Remember to keep a performance log.

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

---

**DO NOT DO THESE EXERCISES**

- Deep knee bends
- Double leg lifts (raising both legs while lying on the 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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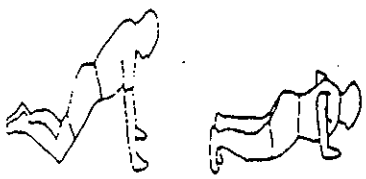
Exercise Descriptions

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

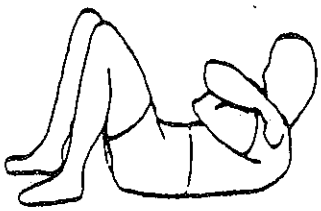
1. PUSH-UPS



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

With hands outside the shoulders, push up while keeping the back straight. Push ups can be performed with legs straight and your weight resting on toes, or with legs bent and weight resting on your knees. Return until the chest almost touches the floor. Aim at increasing by at least 2 push-ups per week.

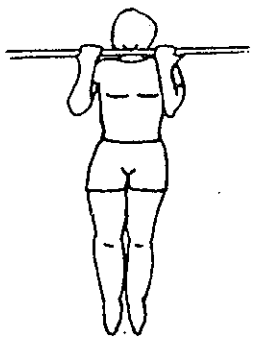
**For the upper abdominal region.**



Lie face up on the floor with legs bent and lower back flat against floor. Using abdominal muscles, pull head and shoulders off of floor while looking up. Hands and arms may be crossed over chest, supporting head, on floor or sliding up legs. Increase by at least 2 per week.

3. CHIN-UPS

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



With an underhand grasp, pull up until the chin is over the bar. Let down as slowly as possible. Increase by at least 1 per week.

4. LEG LIFTS

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

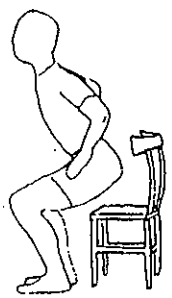
Lie face down on the floor. Place chin on floor and arms flat on floor with elbows bent and palms flat on floor next to your head. Raise one leg, keeping hips on floor. You may bend your knee slightly to relieve any strain in the other side. Lower. Repeat on other side. Increase by at least 1 per week, up to a maximum of 15 raises.

**For the outer thigh muscles.**

Lie on right side with head resting on outstretched right arm and with left hand on floor in front of trunk. Lift the upper leg as high as possible and then return to the starting position. Keep the knee straight. Continue lifting on the same side and then turn over and do the same number of lifts on the other side. Increase the number of leg lifts on each side by at least 2 per week, up to a maximum of 25 per side.

6. CHAIR SQUATS

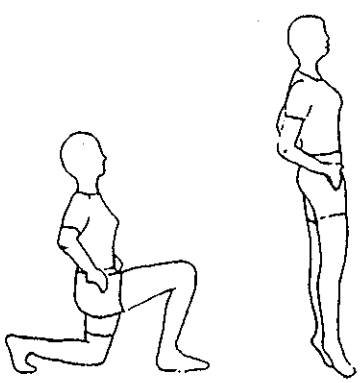
**For the leg muscles.**



Stand about 6 inches in front of a chair, facing away from the chair. With feet apart and hands on the hips, squat until the thighs are almost parallel to the ground, without sitting down on the chair. Hold. Return to the standing position. Put a 2-inch high block under the heels to aid balance. Increase the number of bends by at least 1 per week. As an advanced exercise, this exercise could also be done with a weight on the back, for example, a backpack.

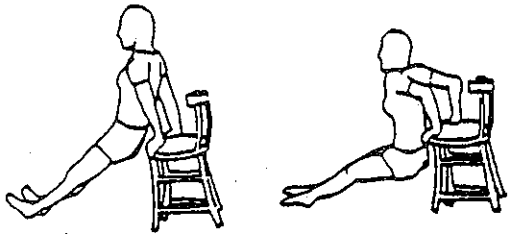
7. SQUAT JUMPS

**For the leg muscles.**



Stand with the hands on the hips, one foot a step ahead of the other. Bend the knees until the legs are at a 90-degree angle and then jump as high as possible, straightening out the knees. Switch the position of the feet on the way down and then jump again. Each jump counts as 1. Increase the number of jumps by at least 2 per week, up to a maximum of 40 jumps.

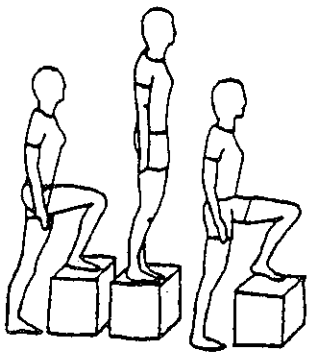
**For muscles in the arms, shoulders, and chest.**



Grasp the sides of a chair and let your feet slide forward while supporting your weight on your arms. Lower your body toward the chair by bending the elbows to about 90 degrees and then push up to the starting position. Increase by at least 1 per week.

9. BENCH STEPS

**For the leg muscles.**



Step up onto a bench that is 8-12" high, bringing up both feet and then down again, one 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.

10. HAND-GRIP STRENGTH

**For the finger and hand 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 the other hand and grip and squeeze 8 times. Repeat the sequence 4 times for each hand. Increase the number of contractions per hand by 2 each week while keeping the number of repeats for each hand at 4.

## B. 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 program provided here will exercise all the major muscle groups that will be used in the Physical Ability Test. A 16-week training progression is given on the next page. The table recommends the following:

**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 repetitions performed of 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 prescribed for this program can be performed through the combined use of free weights and weight machines, or through the use only 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 beginning or initial load (IL) is given at the end of each exercise description. If you cannot move the recommended load or cannot complete the 4 reps to start your program, reduce the recommended load by increments of 5 lbs. until you are able to complete 4 consecutive movements. Record the load.

If, on the other hand, the recommended initial load does not appear to stress you for the beginning 4 reps, 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 <u>once</u> in a specific exercise. Use 70% 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.

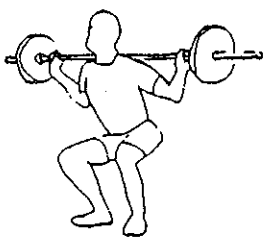
The weight training exercises are presented in the order in which it is suggested they be performed. This program should be performed 3 times per week. Keep a log of the loads and number of repetitions, as appropriate. The suggested load increments are provided in the table on the next page.

| Week | Load | Reps | Sets |
|---|---|---|---|
| 1 | Initial Load (IL) | 4 | 3 |
| 2 | IL | 5 | 3 |
| 3 | IL | 6 | 3 |
| 4 | IL | 7 | 3 |
| 5 | IL | 8 | 3 |
| 6 | IL+ 5 lb | 4 | 3 |
| 7 | IL+ 5 lb | 5 | 3 |
| 8 | IL+ 5 lb | 6 | 3 |
| 9 | IL+ 5 lb | 7 | 3 |
| 10 | IL+ 5 lb | 8 | 3 |
| 11 | IL+ 10 lb | 4 | 3 |
| 12 | IL+ 10 lb | 5 | 3 |
| 13 | IL+ 10 lb | 6 | 3 |
| 14 | IL+ 10 lb | 7 | 3 |
| 15. | IL+ 10 lb | 8 | 3 |
| 16 | IL+ 10 lb | 9 | 3 |

Exercise Descriptions

**Be sure to complete a warm-up period prior to weight training.**

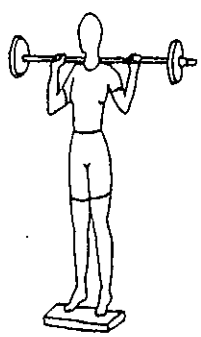
1. SQUATS



**For hip, knee, and trunk extensors.**

Standing erect, feet shoulder-width apart, place the bar on your shoulders behind the neck. Grip the bar with the palms forward and spread the hands far apart on the bar. Keeping the back straight and head up, lower the bar by bending your knees to about 90 degrees. Return to the starting position. Suggested initial load: ½ of body weight.

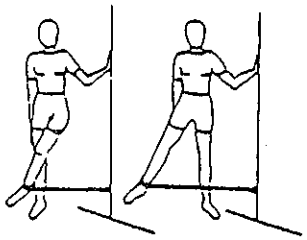
2. HEEL LIFTS



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

With the barbell or weight machine bar behind the shoulders, at the back of the neck (as in the squat), raise upward on your toes as high as possible and then slowly return the heels to the floor. The balls of your feet should be on a 1-2 inch high block. Suggested initial load: ½ of body weight.

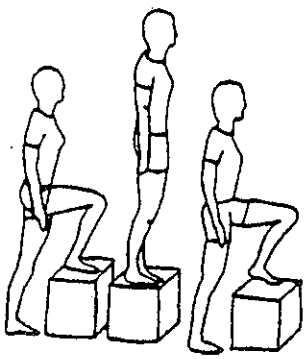
**For hip and thigh muscles.**



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

4. BENCH STEPS

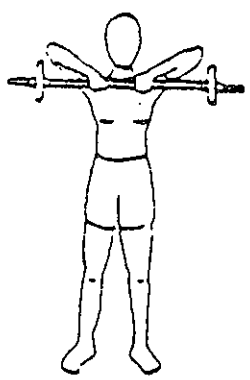
**For the leg muscles.**



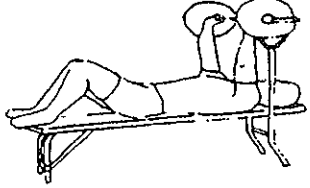
Step up onto a bench 8-12" high, bringing up both feet and then down again, one at a time, for 30 seconds ("up-up-down-down"). Increase the time for each lead foot by 10 seconds per week, up to a maximum of 60 seconds of stepping up and down with each lead foot.

5. UPRIGHT ROWING

**For shoulders, arms, and upper back.**



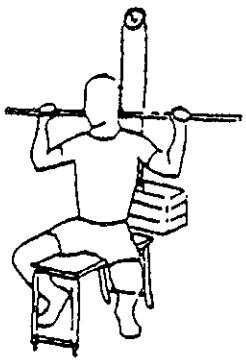
Stand erect with feet apart. Hold the bar with an overhand grip, with your hands 1-2 inches apart at the center of the bar. Start with the bar held at hip level, lift the bar to your chin while keeping your elbows above the bar and the bar close to the body. Return to the starting position. Suggested initial load: 1/4 of body weight.



Lie on your back on a bench with your feet on the bench. Hold the bar above the chest with an overhand grip, hands slightly wider than shoulder width, and elbows straight. Lower the bar to your chest and then immediately return it to the starting position. Suggested initial load: 1/4 of body weight.

7. LATERAL PULL-DOWNS

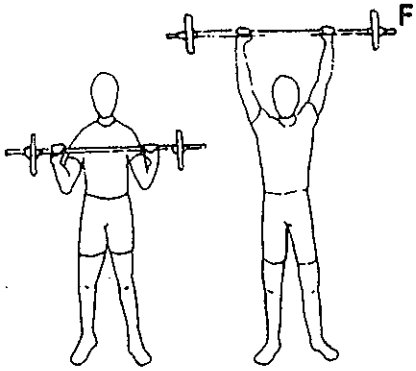
**For muscles in the shoulders and arm flexors.**



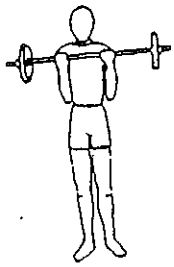
Start from a sitting position on a bench or a kneeling position on the floor. Grip the bar with palms forward, hands more than shoulder-width apart, and elbows straight. Pull the bar down to the base of the neck and shoulders and slowly return to the starting position. Suggested initial load: 1/4 of body weight.

8. STANDING OR OVERHEAD PRESS

**For muscles in the shoulders and arm extensors.**



Stand erect with feet shoulder-width apart, palms forward and shoulder-width apart, with the bar touching the chest. Push the bar straight up to an overhead position until the arms are straight and then lower it in a controlled manner to the starting position. Do not arch your back. Suggested initial load: 1/4 of body weight.

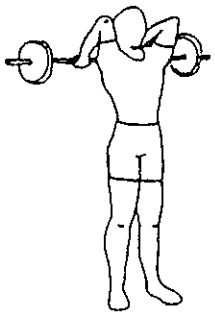


**For the muscles that bend the elbow.**

Standing with the elbows straight and in front of the thighs, hold the bar with an underhand grip, hands shoulder-width apart. Keeping the 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 body weight.

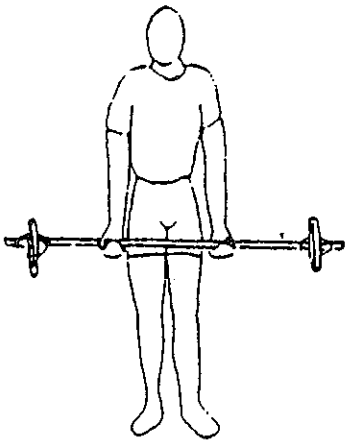
10. TRICEPS EXTENSION

**For muscles that extend the elbow.**



Stand with knees straight and feet about shoulder-width apart. Use an underhand grip, hands shoulder-width apart, and elbows forward and up to a fully locked arms overhead position and kept as stationary as possible and pointing straight up. Start with the bar behind the neck. Straighten your elbows pulling the bar down and then return to the starting position. Suggested initial load: 1/4 of body weight.

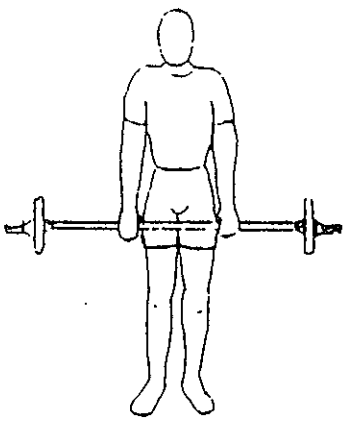
**For muscles that bend the wrist.**



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

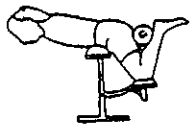
12. REVERSE WRIST CURLS

**For muscles that extend the wrist.**



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

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



Lie on your abdomen, with the trunk unsupported over the edge of the trunk lift station support, and bent. With the 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.

14. CURL-UPS

**For the upper abdominal region.**

Lie face up on the floor with legs bent and lower back flat against floor. Using abdominal muscles, pull head and shoulders off of floor while looking up. Hands and arms may be crossed over chest, supporting head, on floor or sliding up legs. Increase by at least 2 per week.

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 16 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.

| Week | Distance (miles) | Time Goal (minutes: seconds) | Times per Week |
|---|---|---|---|
| 1 | 2.0 | 32:30 | 3 |
| 2 | 2.0 | 30:30 | 3 |
| 3 | 2.0 | 27:00 | 3 |
| 4 | 2.0 | 26:00 | 3 |
| 5 | 2.0 | 25:00 | 3 |
| 6 | 2.0 | 24:30 | 3 |
| 7 | 2.0 | 24:00 | 3 |
| 8 | 2.0 | 22:00 | 3 |
| 9 | 2.0 | 21:00 | 3 |
| 10 | 2.0 | 19:00 | 3 |
| 11 | 2.0 | 18:00 | 4 |
| 12 | 2.0 | 17:00 | 4 |
| 13 | 2.5 | 22:00 | 3 |
| 14 | 2.5 | 21:30 | 4 |
| 15 | 3.0 | 27:00 | 3 |
| 16 | 3.0 | 26:30 | 4 |

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 of exercises, 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 aerobic training program is designed to develop cardiovascular endurance as well as muscular endurance in the legs. These are needed for the Physical Ability Test. The running and the stair climbing programs should be done 3 times per week, or as indicated.

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 the 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. These are a part of the warm-up set and their descriptions can be found in the Warm-up Exercises section of this handbook.

- Modified hurdler
- 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 above exercises from the warm-up set.

# SECTION III: WEEKLY LOG PAGES

## A: Weekly Log: Calisthenics and Aerobics

Date of first day of week:_____ Weight:_____

Training Week Number:_____

| NUMBER OF REPETITIONS (#) OR TIME (T) | | | | | |
|---|---|---|---|---|---|
| Exercise | | Session 1 Date:_____ | Session 2 Date:_____ | Session 3 Date:_____ | Session 4 Date:_____ |
| Push-ups | (#) | | | | |
| Curl-ups | (#) | | | | |
| Chin-ups | (#) | | | | |
| Leg lifts (max=15/side) | (#) | | | | |
| Side leg lifts (max=25/side) | (#) | | | | |
| Chair squats | (#) | | | | |
| Squat jumps (max=40) | (#) | | | | |
| Stair Run | (#) | | | | |
| (max=10 min) | (T) | | | | |
| Running miles | (#) | | | | |
| | (T) | | | | |
| Bench steps (max=60 sec) | (T) | | | | |

## B: Weekly Log: Weight Training and Aerobics

Date of first day of week:_____ Weight:_____

Training Week Number:_____ RM:_____ Sets: 3/Session

| LOAD (L), REPETITIONS (#), OR TIME (T) | | | | | |
|---|---|---|---|---|---|
| **Exercise** | | **Session 1 Date:_____** | **Session 2 Date:_____** | **Session 3 Date:_____** | **Session 4 Date:_____** |
| Curl-ups | (#) | | | | |
| Squats | (L) | | | | |
| Standing or overhead press | (L) | | | | |
| Heel Lifts | (L) | | | | |
| Lateral pull-downs | (L) | | | | |
| Trunk lifts (max=15) | (#) | | | | |
| Arm curls | (L) | | | | |
| Bench press | (L) | | | | |
| Side leg raises | (L) | | | | |
| Triceps Extension | (L) | | | | |
| Bench steps (max=60 sec) | (T) | | | | |
| Upright rowing | (L) | | | | |
| Stair run | (#) | | | | |
| (max=10 min) | (T) | | | | |
| Running miles | (#) | | | | |
| | (T) | | | | |

## SECTION IV: SUMMARY OF PHYSICAL ABILITY TEST AND DESCRIPTION OF EXERCISE TRAINING PROGRAM

### A. Tulsa Firefighter Physical Ability Test

You are advised of the following:

- Wear clothing appropriate for physically demanding work.
- You may wear gloves and/or kneepads, however, these items WILL NOT be provided for you. You must bring your own gloves and kneepads if you want to wear them.
- Wear sneakers or rubber soled shoes.

Because the Physical Ability Test is physically demanding, it is suggested that you refrain from eating at least two hours before the events. 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 test.

The Firefighter Physical Ability Test consists of 7 events that require you to perform simulations of activities that are part of the firefighter's job. As indicated earlier, these events require cardiovascular fitness, muscle strength, muscular endurance and flexibility. Each event will be timed. During all events, you will wear a weighted vest which approximates the weight of the clothing, equipment and breathing apparatus that a firefighter normally wears during these types of activities. The events are described below. They will be performed in the order listed.

1) **Stepmill:** This event simulates continuous stair climbing, an activity that firefighters may perform when getting to a fire at an incident scene. For this event, the candidate will be required to step on a rotating stair case (Stepmill), at a pre-determined stepping pace for a specific period of time.

2) **Ladder Event:** This event simulates various activities related to using ladders. You will be required to remove a ladder from a rack, carry it some distance, raise an extension ladder of approximately 45 lbs. lower the ladder and return the 1st ladder to the rack from which it was taken. The event ends when this ladder is back in the rack.

3) **Hose Drag:** This event simulates the actions necessary to manipulate a fully charged fire hose. You will be required to pull 50 feet of hose through a U-shaped course with several turns. There will be a ceiling on the U-shaped course to prevent you from standing upright.

4) **Forcible Entry:** This event simulates breaking down a door to gain entry to a burning structure or an incident scene. For this event you will be required to strike a rubber pad mounted on a moveable post. You will use a 7 lb. sledge hammer to move the post a set distance. The post and structure are weighted to simulate the force you would need to exert on a door in order to gain entrance. Your score will be based on the time it takes to move the post the required distance and the number of blows taken.

5) **Search:** This event simulates the actions necessary to enter and search a smoke-filled structure. You will be required to crawl through a dark wooden tunnel with obstructions and turns. The tunnel is approximately 65 feet long. The tunnel is 4 feet high and 4 feet wide. At one location in the tunnel there is an obstacle on the floor and at one location there is an obstacle from the ceiling. In addition, at two locations, the tunnel is reduced from 4 to 3 feet in width.

6) **Rescue Through a Doorway:** This event simulates the actions necessary to drag an unconscious victim from a burning building or other emergency scene. You will be required to drag a 130 pound dummy approximately 30 feet, along a zigzag course to a designated area at the end of the course. In this event, there is a low ceiling over the course to prevent you from standing upright.

7) **Ceiling Hook (Pike Pole):** This event simulates the use of a pike pole or ceiling hook. A pike pole or ceiling hook is a firefighting tool used to tear down ceilings or open walls while looking for hidden fires. This event will require you to take a pike pole, tipped with an industrial hammer head, and thrust it upward at a metal plate in an 8 foot ceiling. The metal plate weighs approximately 60 lbs and must be lifted six inches in order for the strike to count. You will then step over to the next part of the event, where a pike pole handle is suspended from a ceiling height. The pole is attached to a counter balance that weighs approximately 80 lbs. You must pull the pole down six inches in order for the pull to count. You will be required to perform one push and five pulls in a sequence. The event will require you to perform four one-minute periods of work, in which you will try to do as many push-pull sequences as possible. Each work period will be followed by a 30 second rest period.

## B. Application of the Exercise Training Program to Firefighter Tasks and the Physical Ability Test

The Physical Ability Test (PAT) is designed to assess your capacity to perform the tasks ordinarily performed by a firefighter during his/her job. The exercise training program described in these Guidelines provides you with the information necessary to improve your level of physical fitness in preparation for taking the PAT. All of the exercises described in the training program are selected to improve muscle strength, muscle power, flexibility, cardiovascular endurance and muscular endurance. The training program will condition the muscles and muscle groups involved in the tasks performed by a firefighter and the events that make up the PAT. The following table provides information to explain the link between the exercises in the program and specific events that make up the PAT.

| PAT Event | Firefighter Task | Exercise |
|---|---|---|
| **Stepmill Event** | Continuous stair climbing to get to the fire floor or reach a victim | **Warm-up:** Standing Cat Stretch, Shoulder Turn, Stride Stretch, Modified Hurdler, Toe Pull, Knee to Chest, Wall Lean<br><br>**Calisthenics:** Leg Lifts, Side Leg Lifts, Chair Squats, Squat Jumps, Bench Steps<br><br>**Weight Training:** Squats, Trunk Lifts, Side Leg Raises<br><br>**Aerobic Training:** Stair Running, Walk/Job Program |
| **Ladder Event** | Raising/Carrying a ladder | **Warm-up Exercises:** Side to Side Look, Forward/Down Look, Standing Cat Stretch, Shoulder Turn, Chest Stretch, Shoulder Stretch, Arm Circles, Side Stretch or Reach<br><br>**Calisthenics**: Push-ups, Chair Squats, Dips<br><br>**Weight Training:** Squats, Standing or Overhead Press, Lateral Pull-downs, Trunk Lifts, Arm Curls, Bench Press, Triceps Extension, Upright Rowing. |
| **Hose Drag** | Moving and handling a hose at the scene of a fire | **Warm-up:** Standing Cat Stretch, Shoulder Turn, Chest Stretch, Shoulder Stretch, Arm Circles, Side Stretch or Reach, Stride Stretch, Knee to Chest, Wall Lean<br><br>**Calisthenics:** Push-ups, Chin-ups, Leg Lifts, Side Leg Lifts, Chair Squats, Squat Jumps, Dips, Bench Steps<br><br>**Weight Training:** Squats, Standing or Overhead Press, Heel Lifts, Lateral Pull-Downs, Trunk Lifts, Arm Curls, Bench Press, Side Leg Raises, Triceps Extension, Upright Rowing |

| PAT Event | Firefighter Task | Exercise |
|---|---|---|
| Forcible Entry | Breaking through a door to gain entry to a burning structure | **Warm-up:** Shoulder Turn, Chest Stretch, Shoulder Stretch, Arm Circles<br><br>**Calisthenics:** Push-ups, Curl-ups, Chin-ups, Dips<br><br>**Weight Training:** Curl-ups, Standing or Overhead Press, Lateral Pull-downs, Arm Curls, Bench Press, Triceps Extension, Upright Rowing |
| Search Event | Finding a victim in a dark enclosed structure | **Warm-up:** Side to Side Look, Forward and Down Look, Standing Cat Stretch, Shoulder Stretch, Stride Stretch, Modified Hurdler, Knee to Chest<br><br>**Calisthenics:** Push-ups, Chair Squats, Squat Jumps, Bench Steps<br><br>**Weight Training:** Squats, Trunk Lifts |
| Rescue Event | Dragging an unconscious victim from a burning building or other emergency structure | **Warm-up:** Side to Side Look, Forward and Down Look, Standing Cat Stretch, Shoulder Turn, Chest Stretch, Shoulder Stretch, Arm Circles, Side Stretch or Reach, Stride Stretch, Modified Hurdler, Knee to Chest, Wall Lean<br><br>**Calisthenics:** Curl-ups, Chin-ups, Leg Lifts, Side Leg Lifts, Chair Squats, Squat Jumps, Dips, Bench Steps<br><br>**Weight Training:** Curl-ups, Squats, Standing Overhead Press, Heel Lifts, Lateral Pull-Downs, Trunk Lifts, Arm Curls, Bench Press, Side Leg Raises, Triceps Extension, Upright Rowing<br><br>**Aerobics:** Stair Climbing, Walk/Job Program |
| Ceiling Hook | Use a ceiling hook to tear down a ceiling after a fire | **Warm-up:** Side to Side Look, Forward and Down Look, Standing Cat Stretch, Shoulder Turn, Shoulder Stretch, Stride Stretch, Knee to Chest, Wall Lean<br><br>**Calisthenics:** Push-ups, Chin-ups, Leg Lifts, Chair Squats, Squat Jumps, Dips, Bench Steps<br><br>**Weight Training:** Squats, Standing Overhead Press, Lateral Pull Downs, Trunk Lifts, Arm Curls, Bench Press, Triceps Extensions, Upright Rowing<br><br>**Aerobics:** Stair Climbing, Walk/Jog Program |

## SECTION V: REFERENCES

The following sources were used as references in the developing this fitness program.


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. Fourth Edition. Philadelphia: Lea & Febiger, 1991.

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.

## CONCLUSION

This Preparation Guide represents an attempt to familiarize you with all aspects the examinations, including the items or exercises, logistics and evaluation procedures; as well as to provide some suggestions for preparation. 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 examinations and on the job.