

Physical Fitness Testing Components

Physical fitness can be defined in two categories: health-related and motor-related. The health-related components of physical fitness are of great importance because they make an individual fit, functional and productive for everyday living. Motor-related components make an individual successful in athletics or motor developed activities.

Health Related

- A. Strength
- B. Dynamic Strength
- C. Flexibility
- D. Cardiovascular
- E. Body Composition

Motor Related

- A. Coordination
- B. Agility
- C. Power
- D. Balance
- E. Speed
- F. Accuracy

The health-related components are those tested to determine an applicant's fitness level. This approach emphasizes basic, functional fitness, not agility tasks. The controlled tests that are performed and the fitness norms used to determine these fitness levels are prescribed from Dr. Kenneth Cooper's Institute of Aerobics Research in Dallas, Texas whose expertise in the area of exercise physiology is well known.

The following tests and their descriptions are used to determine the health-related fitness levels of the applicants. The accompanying tables for each test list the percentile levels of the population norms. It is expected that participants will perform their optimal level on each event, as this process is a physical fitness assessment. For qualification, each candidate must rank at the 50th percentile or higher in all events.

Note: Participants in the fitness testing are to pace themselves throughout the phases of the assessment process. Furthermore, it is suggested that participants consult with their physicians regarding the contract of this testing. This testing may have an effect relative to any past or present illness, condition or injury and may affect their participation in, and ability to perform the testing program.

Components of Fitness Testing

- 1) **Strength:** The amount of tension a muscle can exhibit in one maximal contraction. Two tests that go through the full range of motion, which meets the total body-strength criterion, are the single repetition maximum bench press and leg press.
 - a) Procedure
 - i) Estimate the weight that an individual can press in one maximum effort.
 - ii) Bench press: Load the weights about one-half of the estimated weight or the following: Male – 2/3 body weight, Female – 1/2 body weight.
 - iii) Leg Press: Weights are loaded to body weight for both males and females.
 - iv) Individual is instructed to press the weight once for an easy warm-up.
 - v) Loading of the weights is increased in ten-pound or more increments to maximum. The first three to four repetitions serve as warm-up lifts in order to prevent injury and to prepare for a maximal lift on the fifth or sixth effort.

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- vi) Score for this test is the maximum number of pounds lifted in one repetition.
 - vii) Performance factor is dividing the maximum weight lifted by the body weight of the candidate.
- 2) **Dynamic Strength – Muscular Endurance Testing:** The ability to contract the muscle repeatedly over a period. Low muscular endurance indicates inefficiency in movement and low capacity to perform work.
- a) **Sit-up Test:** Indicates the muscular endurance of the abdominal muscle group, an area of important concern.
 - i) Start by lying on back with knees bend, heels flat on the floor.
 - ii) A partner holds the feet down.
 - iii) Subject then performs as many correct sit-ups as possible in one minute.
 - iv) In the up position, the individual should touch elbows to knees and return to a full lying position before starting the next sit-up.
 - v) Score is the total number of correct sit-ups.
 - b) **Push-up Test:** Measures muscular endurance of the shoulder (deltoids, pectorals and triceps.)
 - i) Test administrator places his fist on the floor below the subject's chest.
 - ii) Subject must keep back straight at all times. From the up position, lower himself to the floor until the chest touches the administrator's fist and then push back to the up position again.
 - iii) Subject repeats push-ups for one-minute non-stop, except in the up position.
 - iv) Total number of correct push-ups in one-minute is recorded as the score.
 - c) **Victim Rescue (Lift/Carry/Drag):** Measures muscular endurance of the arms, shoulders, back, and legs. Also measures muscle strength, coordination, agility, power, balance, and accuracy.
 - i) Strictly "PASS" or "FAIL" as there is no time component to this task.
 - ii) Candidate must lift/carry/drag (or any combination of the above) a 180 lb. rescue mannequin backwards 100 feet (the mannequin's feet must completely cross the line).
 - iii) Candidate may choose to use the attached webbing to drag the rescue mannequin, all while still using the appropriate backwards motion (the rescue mannequin cannot be pushed in a forward motion going in the backwards direction).
 - iv) Candidate must complete the task in full with the initial chosen technique (lift/carry/drag versus utilizing webbing to drag initially). Example: Candidate may not start the task by lifting the rescue mannequin and then later transition into utilizing the webbing to drag the rescue mannequin halfway through the task.
 - v) If the candidate loses their grip or falls during the backward motion, a one time ten second period will be allowable to re-position and reset the lift/carry/drag. Backwards motion must commence prior to the ten second time period passing.
- 3) **Flexibility:** Flexibility is included in total assessment because of the widespread problems of lower back pain and joint soreness. Flexibility is the range of possible movement in a joint or group of joints. It is necessary to determine the functional ability of all joints, however, the trunk flexion or the sit-and-reach test serves as an important measure of hip and back flexibility.
- i) Subject should warm-up slowly by practicing the test.

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- ii) Subject sits on the floor with legs extended at right angles against a box.
 - iii) Heels touch the near edge of the box and are eight inches apart.
 - iv) A yardstick is placed between the legs of the subject and rests on the box with the 15" mark on the edge of the box, short end towards the subject.
 - v) Subject slowly reaches forward with both hands as far as possible and holds the position momentarily.
 - vi) The distance reached on the yardstick by the fingertips is recorded.
 - vii) The best of three trials is considered the flexibility score.
- 4) **Cardiovascular Endurance – Aerobic Power Test:** the term “aerobics” was adopted from the term “aerobic” which refers to the type of metabolism utilizing oxygen in the production of energy for the body. The 1.5 mile run/walk test is used to determine the efficiency of the cardio-respiratory system.

a) 1.5 Mile Run/Walk

- i) An indoor (or outdoor) track is used, or another suitable running area measured so that exact distances are indicated.
- ii) Using a stopwatch to measure time, each participant will run/walk to the best of their ability covering enough laps of the track to measure 1.5 miles. Record each participant's time as they cross the line at 1.5 miles.
- iii) Each participant's time will be measured against the data tables using standard norms for the most recent Cooper Protocol and scored accordingly.

b) Important Suggestions

- i) Pace to avoid fatigue: practice running and pacing prior to the test.
- ii) On test day, refrain from eating two hours preceding the test.
- iii) Allow adequate time for stretching and warm-up exercises.
- iv) During the test, time will be called out.
- v) Cool down: keep walking for five to ten minutes after the run to prevent pooling of blood in the lower extremities.