

# PHYSICAL EDUCATION



## TEST & MEASUREMENT IN SPORTS

### Test And Measurement

Test and measurement is the instrument for getting essential details regarding the needs, capacities, abilities and attitudes of students or sportspersons.

Every task and work needs to be evaluated. Evaluation is based upon test and measurement. This is very important to check the progress of an individual.

Test provides data or scores which can be measured and evaluated. A test helps to collect data which can be evaluated for further improvement.

In Physical Education Tests are used to collect information or data about a specific skill, strength, endurance, knowledge and attitude. And Measurement is related to measuring size, height, weight, vital capacity, achievement, etc.

### Motor Fitness Test And Measurement

Motor fitness refers to the capacity of an athlete to take part effectively in particular sports. It can also be said that the fitness is a person's ability to do physical activity

Motor fitness is the ability to perform physical activities effectively and efficiently. There are 5 motor fitness components which measures' fitness level of an athlete.



These components are Strength, Endurance, Flexibility, Speed, Coordination/agility. Test to

check these components are as follows.

### **Test Items**

- 50 M Standing Start - For speed
- 600 M Run/Walk - For Endurance
- Sit & Reach - For flexibility
- Partial Curl Up- For abdomen strength
- Push Ups (Boys) - For arm strength
- Modified Push Ups (Girls) - For arm Strength
- Standing Broad Jump - For leg explosive strength
- 4 × 10 M Shuttle Run - For agility

### **50 M Standing Start**

50m race is administered to test the athlete's speed. This test includes running 50 meters as fast as possible.

#### **Procedure**

Stand behind the starting line without touching the ground. One foot in front of the other.

Once the subject is ready, the starter gives the instructions "set" then "go. The athlete starts and crosses the end line as fast as possible.

### **600m run/walk**

This test is to measure the endurance level.

#### **Procedure**

Stands behind the starting line. At the signal Ready and Go, The athlete starts running. In between, he can run or walk. Time is recorded.

### **Sit and Reach Test**

This test is conducted to measures the flexibility of the lower back and hamstring muscles.

#### **Procedure**

Sit on the floor without shoes, legs stretched, knee straight, palm facing downward. The subject

tries to reach forward along the measure line as far as possible without giving any jerks

### **Partial Curl Up**

The partial curl-up test is to test abdomen strength. The subjects perform as many sit-ups as possible at the rate of one every three seconds.

#### **Procedure**

Lie down on the back with the knees flexed. The subject curls up, until the shoulders come off the mat two inches, then go back again.

A total number of repetition of sit-ups is recorded in one minute.

### **Push Ups For Boys**

This push-up test is to measure upper body strength and endurance.

#### **Procedure**

From prone position push whole body up, hands and toes touch the floor, the body and legs in a straight line, feet slightly apart, keep the back and knees straight,

Lowers the body to a 90-degree angle at the elbows, then returns to position, continue till exhaustion,

### **Modified Push Ups For Girls**

The Modified Push-Up test is used to measure upper body strength, endurance and trunk stability

#### **Procedure**

Get down on your hands and knees with your hands just outside the shoulder. Now bend your elbows and lower your chest till 90° at the elbows.

Push your body up so that your arms are straight, the test will continues until exhaustion

### **Standing Broad Jump**

The purpose of this test is to measure the explosive power of the legs.

#### **Procedure**

Stand behind a line marked on the ground with feet slightly apart. Now jump as far as possible, landing on both feet without falling backwards.

## 4 × 10 M Shuttle Run

This test measures agility and speed

### Procedure

Stand behind the starting line. On the signal, go, sprint to the opposite line, which is marked 10 m away. Pick up one block of wood (two wood block kept behind the line beforehand), run back to starting position, place the block on or beyond the line.

Take turn without a rest, run back to get the second block and carry it back across the finish line. A total of 40 metre is covered.

## Measurement of Cardiovascular Fitness

### Harvard Step Test

Harvard step test was developed by Lucien Brouha and his associates in 1943.

This test is to measure the cardiovascular or Aerobic fitness of an athlete, by checking the recovery rate.

### Requirements:

- One gym bench of 20 inches high for men and 16 inches for women.
- Stopwatch.

### Test Administration

In this test, Athlete step-ups and step-down on the gym bench for five minutes or until exhaustion, at a rate of 30 steps per minute.

On the command 'go' an athlete starts doing steps, stopwatch is switched on simultaneously. After completing athlete sits down immediately.

**Pulse 1:** The assistant measures the total number of heartbeat counted for 30 sec after 1 min of completion.

**Pulse 2:** The assistant measures heartbeat again after 2 min for 30 sec.

**Pulse 3:** The assistant measures pulse again after 3 minutes for 30 sec.

### Calculation:

$100 \times \text{Test duration in seconds} / 2 \times \text{Sum of pulses}$

For male excellent score is above 90, and for women it is above 86

## Rockport Walking Test

This test is to measure the Cardiorespiratory fitness of the athlete by measuring VO2 Max ( Maximum Cardiovascular Ability )

**Requirements:**

Running track (200 – 400m)

Stopwatch

Weighing machine

Assistant

**Test Administration**

- Record body weight in pounds.
- Walk or run one mile (1609m) as fast as possible.
- Record the time to complete the one-mile walk.
- Immediately on finishing the walk measure heart rate.

**Calculation**

The formula to calculate VO2 max is:

$$132.853 - (0.0769 \times \text{Weight}) - (0.3877 \times \text{Age}) + (6.315 \times \text{Gender}) - (3.2649 \times \text{Time}) - (0.1565 \times \text{Heart rate})$$

(Weight is in pounds (lbs))

**Gender:** Male = 1 and Female = 0

Time is expressed in minutes

Heart rate is in beats/minute (Age is in years)

**Rikli & Jones – Senior Citizen Fitness Test & Measurement:**

Senior citizen fitness test was developed by Roberta Rikli and Dr. Jessie Jones. This test consists of six easy and simple tests that assess the functional fitness of senior citizens.

**Chair Stand Test**



This test is to check leg strength and muscle endurance.

### **Requirements**

Straight back chair without arms 45 cm high, stopwatch.

### **Test Administration**

- Place the chair against the wall
- The person sits on the chair with feet apart
- Arms crossed at the wrist and held close to chest
- From sitting position stand completely
- Repeats for 30 seconds
- The number of complete chair stand is scored.

### **Arm Curl Test:**



This test measures upper body strength and endurance. The aim is to do as many arm curls in 30 sec.

**Requirements:**

- 4 pound dumbbell for women and 8 pound for men.
- A chair without any armrest.
- Stopwatch.

**Test Administration**

- The person sits on the chair holding the dumbbell, arms vertically downward.
- Curl forearm up through a full range of motion.
- The number of complete Curl actions is the score.

**Sit and Reach Test.**



The purpose of this test is to measure the lower body flexibility.

**Requirements:**



Ruler, Straight back chair 45 cm high

**Test Administration:**

- The person sits on the edge of the chair.
- One foot on the floor and other foot extended with knee straight.
- Exhale and reach towards the toe.
- Keep the back straight and head up.
- Hold the reach for 2 sec.
- Perform the test twice and consider the best.

**Back Scratch Test:**



This test measures the general range of motion of the Shoulder. It requires a ruler

**Test Administration:**

- The test is done in a standing position.
- One hand is kept behind the head over the shoulder.
- Place the other hand behind the back. Fingers up.
- Try to touch both arms finger.
- Try the test twice and consider the best.

**8- Feet Up and Go Test**



This test is designed to measure speed, agility and balance while moving

### Requirements

- Stopwatch
- Straight back chair
- Cone markers
- Measuring tape

### Test Administration:

- Place a chair against the wall
- Keep a cone eight feet away in front of chair
- The person sits on the chair and hands resting on knees
- On the command GO person stand up and walk around the cone as quickly as possible and sit down on the chair
- Scoring is counted based on time taken to perform

### 6 Minute Walk Test



This test is to measure Aerobic fitness.

**Requirements:**

- Measuring tape to mark track distance.
- Stopwatch.
- Chair for rest.

**Test Administration:**

- The walking track is laid in rectangle area with cone marking
- Person walk as quickly as possible for six minutes to cover maximum distance
- Person can set their own pace and can stop to take rest.
- Measure in metres the distance covered by a person in six minutes.