UNIT VI TEST AND MEASUREMENT IN SPORTS

Overview

- Fitness Test – SAI Khelo India Fitness Test in school [Age group 5-8 yrs/ class 1-3: BMI, Flamingo Balance Test, Plate Tapping Test; Age group 9-18yrs/ class 4-12: BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Abdominal Partial Curl Up, Push-Ups for boys, Modified Push-Ups for girls)];
- Measurement of Cardio-Vascular Fitness – Harvard Step Test – Duration of the Exercise in Seconds x100/5.5 X Pulse count of 1-1.5 Min after Exercise;
- Computing Basal Metabolic Rate (BMR);
- Rikli & Jones - Senior Citizen Fitness Test - Chair Stand Test for lower body strength, Arm Curl Test for upper body strength, Chair Sit & Reach Test for lower body flexibility, Back Scratch Test for upper body flexibility, Eight Foot Up & Go Test for agility, Six Minute Walk Test for Aerobic Endurance;
- Johnsen – Methney Test of Motor Educability (Front Roll, Roll, Jumping Half-Turn, Jumping full-turn)

LEARNING OUTCOMES

At the end of the unit, students will be able to:

- perform SAI Khelo India Fitness Test in school [Age group 5-8 yrs/ class 1-3: BMI, Flamingo Balance Test, Plate Tapping Test; Age group 9-18yrs/ class 4-12: BMI, 50mt Speed test, 600mt Run/Walk, Sit & Reach flexibility test, Strength Test (Abdominal Partial Curl Up, Push-Ups for boys, Modified Push-Ups for girls)]
- compute Basal Metabolic Rate (BMR)
- determine physical fitness Index through Harvard Step Test/Rockport Test
- describe the procedure of Rikli and Jones - Senior Citizen Fitness Test
- demonstrate Johnsen – Methney Test of Motor Educability

Discussion

Discuss with your group

- What are the areas that a physical fitness test evaluates?
- How many of you can test your own fitness?
- What are the criteria that you will employ to test your own fitness?
- What is the aim of testing for physical fitness?
- Have you heard of motor fitness? What is it? How is it tested?
- Have you heard about broad jump?

Do you Know

Test protocol is the correct procedure for carrying out a test. If a test is done incorrectly, it might affect the results.

Valid A test is valid if it measures what it sets out to measure e.g., a test for upper body strength should not measure leg strength.

Motor fitness refers to the neuromuscular components of fitness, which enable a person to perform successfully at a particular motor skill, game, or activity. Specific motor fitness components include agility, balance, coordination, power, reaction time, and speed. Motor fitness is sometimes referred to as skill-related fitness.

केन्द्रीय माध्यमिक शिक्षा बोर्ड
(शिक्षा मंत्रालय, भारत सरकार के अधीन एक स्वायत्त संगठन)
CENTRAL BOARD OF SECONDARY EDUCATION
(An Autonomous Organisation under the Ministry of Education, Govt. of India)

CBSE/ DIR(SE&T)/KIFA/2020 19.03.2021

Circular No: Acad-25/2021

Heads of all the Institutions affiliated to CBSE

Subject: **Awareness Programme on 'Whole School Approach to Fitness' and 'Khelo India National Fitness Assessment Programme' by CBSE in collaboration with Sports Authority of India (SAI) under the FIT INDIA MISSION in online mode**

Dear Principal

This is in continuation to CBSE Notification no. 38/2018 dated 12.12.2018, Circular no. 01/2019 dated 09.01.2019, Circular No: Acad-83/2019 dated 30.12.2019 and Acad-38/2020 dated 28.05.2020 regarding the 'Khelo India National Fitness Assessment Programme for Schools'.

Ministry of Youth Affairs and Sports, under the aegis of FIT INDIA and as per NEP, CBSE is organizing an Online Physical Education Training Programme for all PE Teachers. These programmes are aimed at equipping the Physical Education Teachers of CBSE schools with the Knowledge, Skills and Attitude to perform Physical Fitness Assessment tests in their schools. These programmes shall be conducted from 24th March 2021 onwards. These trainings are being offered free of cost to all participants.

Post the training, PE Teachers will be able to register their schools, create profile for themselves, upload student's data, usage of KIFA and learn how to do Assessment. Once the schools reopen, they will be able to start Assessments using Mobile app in their schools.

Please refer to annexures for more **details about the programme** and registering your school.

Please read the letter above and try to think about few of the questions asked below:

I. Why do government and CBSE need to plan for a 'whole school approach to fitness'?

II. What will be the fitness test items for Kehlo India Fitness Assessment for school children?

6.1 Fitness Test – SAI Khelo India Fitness Test in School

Overview: Fitness defines the ability to perform physical activity, and encompasses a wide range of abilities. Each activity and sports requires a specific set of skills, and so being fit for an activity or a sport does not necessarily make you fit for another. Fitness is generally divided into specific fitness categories or components, and each can be tested and trained individually. The following pages will help you do the Fitness Test Administration in your school more effectively using Khelo India Fitness Assessment App and viewing the School Dashboard on School Interface.

BATTERY OF TESTS

AGE GROUP 5-8 YEARS | CLASS 1 to 3 At Primary class 1-3,

Children should acquire Fundamental Movement Skills (FMS) leaving the learning of specific physical activities to later stages. FMS provide the building blocks for many physical activities, such as playing games, dance, and sport. Locomotor, Manipulative & Body Management abilities are key to success in most sports and physical activities. Abilities of children in class 1-3 which need to be measured and tracked are

1. Body Composition (BMI)
2. Coordination (Plate Tapping)
3. Balance (Flamingo Balance)

Which are important for controlling the body in various situations.

AGE GROUP: 9-18+ YEARS | CLASS 4 to 12 For Class 4 to 12,

It is important for students to have an overall physical fitness. The following Components are to be considered in Physical Health and Fitness Profile:

1. Body Composition (BMI)
2. Strength a. Abdominal (Partial Curl-up) b. Muscular Endurance (Push Ups for Boys, Modified Push Ups for Girls)

3. Flexibility (Sit and Reach Test)
4. Cardiovascular Endurance (600 Meter Run/Walk)
5. Speed (50 mt. Dash)

6.1.1 BODY MASS INDEX (BMI)

Purpose: Body Composition refers primarily to the distribution of muscle and fat in the body. Body size such as height, lengths and girths are also grouped under this component.

Infrastructure/Equipment Required: Flat and Clean surface, Weighing Machine, Stadiometer/Measuring Tape pasted on a wall

Procedure:

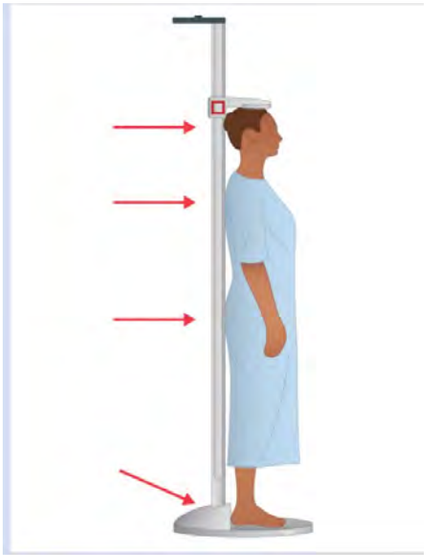
Measuring Height Accurately

Remove the participant's shoes, bulky clothing, and hair ornaments, and unbraid hair that interferes with the measurement. Take the height measurement on flooring that is not carpeted and against a flat surface such as a wall with no moulding. Have the participant stand with feet flat, together, and back against the wall. Make sure legs are straight, arms are at sides, and shoulders are level. Make sure the participant is looking straight ahead and that the line of sight is parallel with the floor. Take the measurement while the participant stands with head, shoulders, buttocks, and heels touching the flat surface (wall). (See illustration.) Depending on the overall body shape of the participant, all points may not touch the wall. Use a flat headpiece to form a right angle with the wall and lower the headpiece until it firmly touches the crown of the head. Make sure the measurer's eyes are at the same level as the headpiece. Lightly mark where the bottom of the headpiece meets the wall. Then, use a metal tape to measure from the base on the floor to the marked measurement on the wall to get the height measurement. Accurately record the height to the nearest 0.1 centimeter.

Measuring Weight Accurately

Use a digital scale. Avoid using bathroom scales that are springloaded. Place the scale on firm flooring (such as tile or wood) rather than carpet. Have the participant remove shoes and heavy clothing, such as sweaters. Have the participant stand with both feet in the center of the scale. Record the weight to the nearest decimal fraction (for example, 25.1 kilograms).

Scoring: The test performed is Body Mass Index (BMI), which is calculated from body Weight (W) and height(H). BMI = W / (H x H), where W = body weight in kilograms and H = height in meters. The higher the score usually indicating higher levels of body fat. Height recorded in cm and mm. Weight will be recorded in kilogram (kg) and grams (gms). Record the weight to the nearest decimal fraction (for example, 25.1 kilograms). Accurately record the height to the nearest 0.1 centimeter.



6.1.2 PLATE TAPPING TEST

Purpose: Tests speed and coordination of limb movement

Infrastructure/Equipment Required: Table (adjustable height), 2 yellow discs (20cm diameter), rectangle (30 x 20 cm), stopwatch

Procedure: If possible, the table height should be adjusted so that the subject is standing comfortably in front of the discs. The two yellow discs are placed with their centers 60 cm apart on the table. The rectangle is placed equidistant between

both discs. The non-preferred hand is placed on the rectangle. The subject moves the preferred hand back and forth between the discs over the hand in the middle as quickly as possible. This action is repeated for 25 full cycles (50 taps).

Scoring: The time taken to complete 25 cycles is recorded

6.1.3 FLAMINGO BALANCE TEST

Purpose: Ability to balance successfully on a single leg. This single leg balance test assesses the strength of the leg, pelvic, and trunk muscles as well as Static balance.

Infrastructure/Equipment Required: Non-slippery even surface, Stopwatch, can be done while standing on beam.

Procedure:

Stand on the beam. Keep balance by holding the instructor's hand (if required to start). While balancing on the preferred leg, the free leg is flexed at the knee and the foot of this leg held close to the buttocks. Start the watch as the instructor lets go of the participant/subject. Pause the stopwatch each time the subject loses balance (either by falling off the beam or letting go of the foot being held). Resume over, again timing until they lose balance. Count the number of falls in 60 seconds of balancing. If there are more than 15 falls in the first 30 seconds, the test is terminated.

Scoring: The total number of falls or loss of balance in 60 seconds of balancing is recorded. If there are more than 15 falls in the first 30 seconds, the test is terminated.

6.1.4 AGE GROUP: 9-18+ YEARS | CLASS 4 TO 12

For Class 4 to 12, it is important for students to have an overall physical fitness. The following Components are to be considered in Physical Health and Fitness Profile:

1. Body Composition (BMI)
2. Strength a. Abdominal (Partial Curl-up) b. Muscular Endurance (Push Ups for Boys, Modified Push Ups for Girls)
3. Flexibility (Sit and Reach Test)
4. Cardiovascular Endurance (600 Meter Run/Walk)
5. Speed (50 mt. Dash)

6.1.5 BODY COMPOSITION (BMI)

See 6.1.1

6.1.6 ABDOMINAL (PARTIAL CURL-UP)

Purpose: The curl up test measures abdominal muscular strength and endurance of the abdominals and hip flexors, important in back support and core stability.

Infrastructure/Equipment Required: Flat clean cushioned surface with two parallel strips (6 inches apart), Stopwatch, Recording sheets, Pen

Procedure: The subject lies on a cushioned, flat, clean surface with knees flexed, usually at 90 degrees, with hands straight on the sides (palms facing downwards)

closer to the ground, parallel to the body. The subject raises the trunk in a smooth motion, keeping the arms in position, curling up the desired amount (at least 6 inches above/along the ground towards the parallel strip). The trunk is lowered back to the floor so that the shoulder blades or upper back touch the floor.

Scoring: Record the maximum number of Curl ups in a certain time period (30 seconds).

6.1.7 PUSH UPS (BOYS)/MODIFIED PUSH UPS (GIRLS)

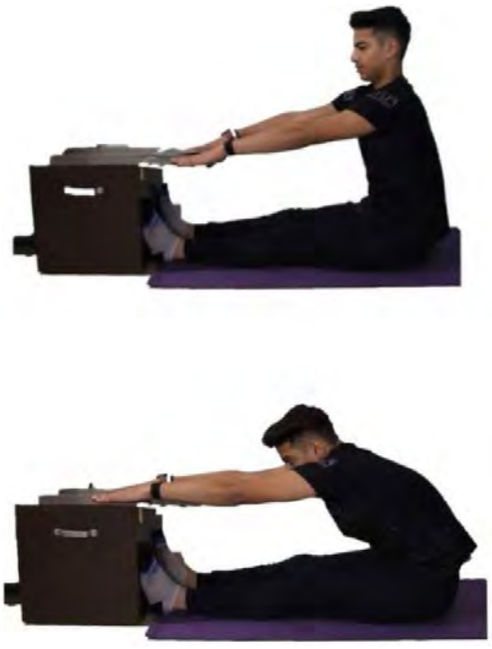
Purpose: Upper body strength endurance, and trunk stability.

Infrastructure/Equipment Required: Flat clean cushioned surface/Gym mat

Procedure: A standard push up begins with the hands and toes touching the floor, the body and legs in a straight line, feet slightly apart, the arms at shoulder width apart, extended and at a right angles to the body. Keeping the back and knees straight, the subject lowers the body to a predetermined point, to touch some other object, or until there is a 90-degree angle at the elbows, then returns back to the starting position with the arms extended. This action is repeated, and the test continues until exhaustion, or until they can do no more in rhythm or have reached the target number of push-ups. For Girls: push-up technique is with the knees resting on the ground.

Scoring: Record the number of correctly completed pushups.

6.1.8 SIT AND REACH



Purpose: Common measure of flexibility, and specifically measures the flexibility of the lower back and hamstring muscles. This test is important because tightness in this area is implicated in lumbar lordosis, forward pelvic tilt and lower back pain.

Infrastructure/Equipment Required: Sit and Reach box with the following dimensions: 12” x 12” (sides) 12” x 10” (front and back) 12” x 21” (top).

Inscribe the top panel with centimeter/mm gradations. It is crucial that the vertical plane against which the subject’s feet will be placed is exactly at the 23 cm mark. Flat clean cushioned surface/Gym Mats

Procedure: This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the Sit and Reach box. Both knees should be locked and pressed flat to the floor - the tester may assist by holding them down. With the palms facing downwards, and hands on top of each other, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. After some practice reaches, the subject reaches out and holds that position for at one-two seconds while the distance is recorded. Make sure there are no jerky movements.

Scoring: The score is recorded (difference between initial position and final position), in cm and mm, as the distance reached by the hand.

6.1.9 600 MTR RUN/WALK

Purpose: Cardiovascular Fitness/Cardiovascular Endurance

Infrastructure/Equipment Required: Stopwatch, whistle, marker cone, lime powder, measuring tape, 200 or 400 mts with 1.22 mt (minimum 1 mt) width preferably on a flat and even playground with a marking of starting and finish line.

Procedure: Participants are instructed to run 600 mts. at the fastest possible pace. The participants begin on signal, "ready, start". As they cross the finish line, the elapsed time should be announced to the participants. Walking is permitted but the objective is to cover the distance in the shortest possible time.

Scoring: Time taken for completion (Run or Walk) in min and sec.

6.1.10 50 MTR DASH (STANDING START)

Purpose: Determines acceleration and speed

Infrastructure/Equipment Required: Measuring tape or marked track, stopwatch, cone markers, flat and clear surface of at least 60 metres.

Procedure: A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary position, with one foot in front of the other. The front foot must be on or behind the starting line. This starting position should be static (dead start). The tester should provide hints for maximizing speed (such

as keeping low, driving hard with the arms and legs) and encouraged to continue running hard through the finish line.

Scoring: Time taken for completion

Do you Know?

General Instructions before Exercise/Testing

Clothes- Students should wear comfortable, loose fitting sportswear during the test.

Food- Students should take food at least three hours before testing. Plenty of fluids should be taken 24 hours before testing. Alcohol and caffeine should be avoided 24 hours before testing.

Rest- Students should take proper rest and sleep on the night of testing. Any strenuous exercise should be avoided on the day of tests.

Warming up and cooling down- Students should do proper warm up and cooling down exercises before and after the testing respectively.

Equipment- Equipment should be calibrated, organized, sterilized and tested before the test. **Administration-** Temperature should not be too hot, cold, or humid. All stationary item should be ready before the test. Students should be informed about the procedure of the test and consent should be taken well in advance.

I. Tick the correct options

1. 50 Mtr Dash is conducted to test:
   a. Strength
   b. **Acceleration**
   c. Flexibility
   d. Endurance
2. Which test can be applied to test Endurance?
   a. Sit and Reach
   b. Push Ups
   c. 600 Mtr Run/Walk
   d. Plate Tapping Test

3. Partial curl up is to test .
   a. agility and speed
   b. leg strength and endurance
   c. abdominal strength and endurance
   d. upper body strength and endurance
4. Sit and reach test measures
   a. endurance
   b. flexibility
   c. strength
   d. speed

II. Answer the following questions briefly

1. Enlist the general equipment used for measuring SAI Khelo India Fitness Test.
2. Explain the procedure to test strength.
3. Write down the process to determine the upper body endurance.
4. Explain the process of 600meter run/walk.

III. Answer the following questions in 150-200 words

1. Describe the procedure of SAI Khelo India Fitness Test.
2. Write down the procedure to conduct SAI Khelo India Fitness Test in school for 5 to 8 years old students.

6.2 Measurement of Cardio-Vascular Fitness

Harvard Step Test

Harvard step test was developed by Brouha in 1943 for the purpose of measuring physical fitness for work and the ability to recover from work. The test was originally designed for young men of college age. In the original validation of the step test Brouha tested 2200 males.

Purpose: To determine aerobic fitness.

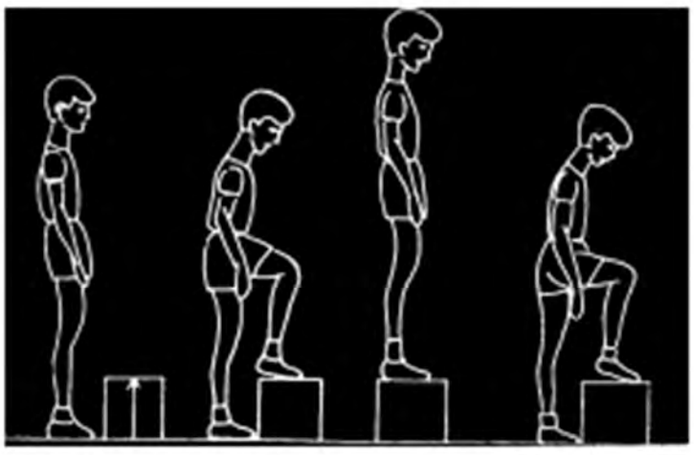
Objective: To perform step test continuously without break for 5 minutes or until

exhausted.

Equipment: Bench or wooden block 20 inches in height; stopwatch; metronome.

Procedure: Student will start test at the command "Go" and will step up and down, on and off the wooden block or bench at the rate of 30 steps per minutes for 5 minutes.

Participant is given instructions that on the command 'up' or the first sound of the metronome, he/she should place one foot on the bench; on the second command 'up' or the second sound of the metronome, he/she should place both feet fully on the bench with the body erect straightening the legs and back.



Exactly five minutes of steps, on the signal 'stop', the participant immediately sits down on the bench. If the student is unable to maintain the pace, then she/he is considered to be exhausted and the test is brought to an end before completion of

5min.

The tester will note the duration of the exercise in seconds and use short formula.

Pulse Count

After completion of the test, the student sits down and the tester takes the hearts beats between 1 to 1½ minutes.

Scoring: Fitness Index score will be determined by applying following equation:

$$\frac{\text{Duration of the Exercise in Seconds x 100}}{\text{5.5 x Pulse count of 1 – 1.5 min after Exercise}} = \text{Fitness Index score}$$

Norms for Harvard Step Test

Upto 49	Poor
50-80	Average
81 or Above	Good

Norms Reference: Dr. D. K. Kansal (2008), Textbook of Applied Measurement, Evaluation and Sports Selection, Sports and Spiritual Science Publication, Delhi, ISBN No.8190228234

6.3 Computing Basal Metabolic Rate (BMR)

The Basal Metabolic Rate (BMR) is the number of calories needed to maintain body function and resting condition. In another words BMR is the number of calories burnt by the body while performing basic life sustaining functions. That is, a person, who does not engage in any work, still requires energy for the functioning of their internal organs. This energy is called Basal Metabolic Rate. Unit of BMR is calculated in Kcal. There are factors that may affect BMR like Muscle Mass, age, state of mind, Gender, Genetics, Body composition etc. Environment changes like change in heat and cold may change the requirement of the body.

Purpose: determine Basal Metabolic Rate

Equipment: Stadiometer, Weight machine, Pen and paper

Procedure: method to measure height and weight is given at BMI

Formula used: The mifflin-St Jeor BMR Equation

Male calculation = (10 * weight(kg.)) + (6.25 * height(cm)) – (5 * age) + 5

Female calculation = (10 * body weight(kg.)) + (6.25 * height(cm)) - (5 * age) – 161

Extension Activity

Every student will prepare their own profile of fitness testing as per below format.

	Week 1	Week 2	Week 3	Week 4
Fitness Index (Harvard step test)				
50M standing start				
600 M Run/ walk				
Sit and reach Test				
Push-ups				
Partial Curl Up				

I. Tick the correct options.

1. The test duration for the Harvard fitness test is
   - i. 3 minutes
   - ii. 4 minutes
   - iii. 5 minutes
   - iv. 6 minutes
2. The Harvard step test is developed by
   - i. Harvard
   - ii. Brouha
   - iii. Kansal
   - iv. SAI
3. What id BMR?
   - i. Bodily Mass Index
   - ii. Body Mass Index
   - iii. Boldy Mass Index
   - iv. Bodley Mass Index

4. Which parameter is not required to assess the BMR

   i. Weight

   ii. Height

   iii. Age

   iv. Name

II. Answer the questions briefly.

1. Write down the procedure of Harvard fitness test.
2. What is a formula to find out Fitness Index score? And enlist equipment which can be used in Harvard fitness test.
3. How can BMR be assessed?

III. Answer the question in 150-200 words.

1. Briefly describe the test used for assessing aerobic fitness

6.4 Rikli and Jones Senior Citizen Fitness Test

The senior citizen's fitness test (SFT) was developed by Rikli and Jones for older people aged between 60 to 94 years. The purpose of the test was to evaluate functional ability and monitor the physical fitness status of older people and to identify problems and work on the weakness. This test should not be practiced by those who have any medical conditions like chest pain, dizziness, high blood pressure, heart problems etc. This test is economical and easy to administer. The test includes the following items:

1. Chair Stand Test for lower body strength
2. Arm Curl Test for upper body strength
3. Chair Sit and Reach Test for lower body flexibility
4. Back Scratch Test for upper body flexibility
5. Eight Foot Up and Go Test for agility
6. Six Minute Walk Test for aerobic endurance Source of all Pictures4

6.4.1 30 SECOND CHAIR STAND TEST

Purpose: To determine lower body strength.

Objective: To complete maximum stands in 30 seconds.

Equipment: Straight back chair without arms; stopwatch.

Procedure: The chair should be placed against the wall or somewhere where it gets stabilized.

Initially, the individual will sit on the chair, back straight, arms crossed and feet firmly on the floor, shoulder width apart.

On the command "Go" the individual will stand up completely, then return back to the initial position. This will be counted as one stand. The individual should be motivated to do maximum stands in 30 seconds.

Scoring: Maximum number of complete stands will be counted as score. If the individual is in half way of the stand and time is over, then it will be counted as a full stand.

6.4.2 ARM CURL TEST

Purpose: To determine upper body strength.

Objective: To complete maximum arm curls in 30 seconds.

Equipment: Straight back chair without arms; Dumbbell for men- 8 pounds (3.6kgs) and women- 5 pounds (2.3kgs); stopwatch.

Procedure: The chair should be placed against the wall or somewhere where it gets stabilized.

The individual sits on the chair with back straight, feet on floor, holing dumbbell with dominant hand using handshake grip.

On the command "Go" the individual flexes the elbow or curls the arm with full range of motion then returns back to its initial position.

In the down position dumbbell will return to handshake grip.

The individual can perform as many arm curls as possible in 30 seconds.

Scoring: Maximum number of correct arm curls in 30 second will be counted.

6.4.3 CHAIR SIT AND REACH TEST

Purpose: To determine lower body flexibility.

Objective: To stretch the lower body as far as possible.

Equipment: Straight back chair without arms; 18 inches ruler.

Procedure: The chair should be placed against the wall or somewhere where the chair gets stabilized.

Participant sits on the chair with one foot flat on the floor and the other leg extended forward with the knee straight, heel on the floor, and ankle bent at 90°.

The participant, then, tries to touch the toe of that foot by bending at the hip and sliding her/his hands towards the toes.

To clock score, participant must hold that position for 2 seconds.

Scoring: Measurement will be taken between extended long finger and tip of the toe and minimum to .5 inches will be recorded as score. If fingers cross the toe, then + will be indicated before the score and if the participant is unable to touch the toe, then – sign will be indicated.

6.4.4 BACK STRETCH

Purpose: To determine upper body flexibility

Objective: To touch or overlap the finger of the both hands behind the back.

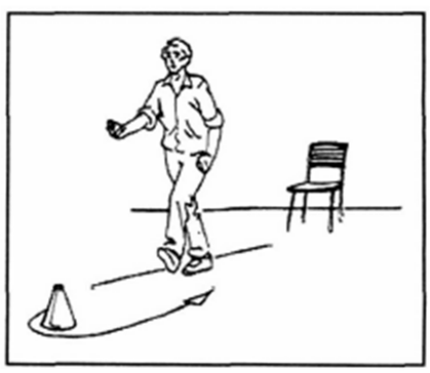
Equipment: 18 inches ruler

Procedure: In standing position participant will place one hand over the shoulder and one hand middle of the back and try to touch or overlap each other.

Scoring: Measurement will be taken by measuring the distance between the tips of the middle fingers. If the fingertips touch, then the score is zero. If they do not touch, measure the distance between the finger tips (a negative score), if they overlap, measure by how much (a positive score).

6.4.5 FOOT UP AND GO

Purpose: To determine physical mobility (power, speed, agility and balance). Objective: To stand and walk 16 feet and sit back as fast as possible (without running). Equipment: Straight back chair without arms; cone; stopwatch,



Procedure: A chair should be placed against the wall or somewhere where the chair get stabilized.

The participant sits on the chair with both feet on the floor.

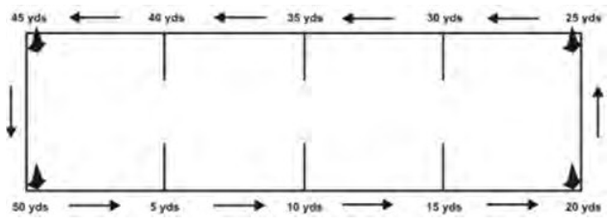
At the command "Go" he/she walks as fast as possible (not running) and returns back after walking to and around the cone which is placed 8 ft away from the chair.

There should be enough space around the cone from where participant can take an easy turn.

Scoring: Two attempts will be made and the best score will be taken for record. Fastest time taken between command "Go" and return to the chair will be recorded.

6.4.6 MINUTE WALK TEST

Purpose: To determine aerobic endurance



Objective: To walk maximum distance in 6 minutes.

Equipment: Walking area of 20 yards each between parallel lines connected with 5 yards lines making rectangles; stopwatch; cone.

Procedure: Participant will start walking after the command "Go" and continuously walk on the track for 6 minutes.

He /she has to cover maximum distance in 6 minutes but without running.

Scoring: Maximum distance covered in 6 minutes will be recorded as score.

6.4.7 MINUTES STEP TEST

Purpose: To determine aerobic endurance.

Objective: To count maximum number of steps in 2 minutes. **This test is performed as an alternative to the 6- minute walk** test for people who use orthopaedic devices when walking, as well as in the case of people who have difficulty balancing.

Equipment: tape for marking the wall; stopwatch; wall.

Procedure: The participant up straight next to the wall while a mark is placed on the wall at the level corresponding to midway between the patella (knee cap) and illiac crest (top of the hip bone).

The participant then marches in place for two minutes, lifting the knees to the height of the mark on the wall. Resting is allowed, and holding onto the wall or a stable chair is allowed.

Stop after two minutes of stepping.

Scoring: The total number of times the right knee reaches the tape level in two minutes is recorded.

Normal Range of Score for Men

Reference: The Journal for Active Aging, March April 2003 Page No. 28

	60-64	65-69	70-74	75-79	80-84	85-89	90-94
Chair stand (no. of stands)	14 - 19	12 - 18	12 - 17	11 - 17	10 - 15	8 - 14	7 - 12
Arm Curl (no. of reps)	16 - 22	15 - 21	14 - 21	13 - 19	13 - 19	11 - 17	10 - 14
6-Min Walk (no. of yds)	610 - 735	560 - 700	545 - 680	470 - 640	445 - 605	380 - 570	305 - 500
2-Min Step (no. of steps)	87 - 115	86 - 116	80 - 110	73 - 109	71 - 103	59 - 91	52 - 86
Chair Sit-&-Reach (inches +/-)	-2.5 - +4.0	-3.0 - +3.0	-3.5 - +2.5	-4.0 - +2.0	-5.5 - +1.5	-5.5 - +0.5	-6.5 - -0.5
Back Scratch (inches +/-)	-6.5 - +0.0	-7.5 - -1.0	-8.0 - -1.0	-9.0 - -2.0	-9.5 - -2.0	-10.0 - -3.0	-10.5 - -4.0
8-Ft Up-&-Go (seconds)	5.6 - 3.8	5.7 - 4.3	6.0 - 4.2	7.2 - 4.6	7.6 - 5.2	8.9 - 5.3	10.0 - 6.2

Normal Range of Score for Women

Reference: The Journal for Active Aging, March April 2003 Page No. 28

	60-64	65-69	70-74	75-79	80-84	85-89	90-94
Chair stand (no. of stands)	12 - 17	11 - 16	10 - 15	10 - 15	9 - 14	8 - 13	4 - 11
Arm Curl (no. of reps)	13 - 19	12 - 18	12 - 17	11 - 17	10 - 16	10 - 15	8 - 13
6-Min Walk (no. of yds)	545 - 660	500 - 635	480 - 615	430 - 585	385 - 540	340 - 510	275 - 440
Chair Sit-&-Reach (inches +/-)	-0.5 - +5.0	-0.5 - +4.5	-1.0 - +4.0	-1.5 - +3.5	-2.0 - +3.0	-2.5 - +2.5	-4.5 - +1.0
Back Scratch (inches +/-)	-3.0 - +1.5	-3.5 - +1.5	-4.0 - +1.0	-5.0 - +0.5	-5.5 - +0.0	-7.0 - -1.0	-8.0 - -1.0
8-Ft Up-&-Go (seconds)	6.0 - 4.4	6.4 - 4.8	7.1 - 4.9	7.4 - 5.2	8.7 - 5.7	9.6 - 6.2	11.5 - 7.3

Do you Know

We can improve fitness through following activities: Muscular Strength: Jumps, throws, weight training

Muscular Endurance: Pull ups, Push-ups, Sit-ups, weight training Cardiovascular Endurance: Long distance running, swimming, cycling Flexibility: Yoga Asana

Speed: 10m, 30m, 50m, 100m sprint etc.

Coordination: ball throw and catching, kicking and stopping ball Agility: Cone, ball, balloon and ladder drills

I. Tick the correct options.

1. Which is not an item of Rikli and Jones Test?
   a. 8 Foot Up and Go
   b. **Sit and Reach test**
   c. 6 Minute Walk Test
   d. Arms Curl Test
2. What is the weight of dumbbell for men in arm curl of Rikli and Jones Test?
   a. 5 pounds
   b. 6 pounds
   c. 8 pounds
   d. 10 pounds

II. Answer the questions briefly.

1. Explain any two test that form part of the Rikli and Jones Test.
2. Write down the purpose of all the tests that form a part of Rikli and Jones Test.

III. Answer the questions in 150-200 words.

1. Discuss any three tests for testing the endurance and agility of senior citizens.

6.5 Johnson – Metheny Test of Motor Education

Objective: Johnson- Metheny Test battery is revised version of Johnson Educability Test which was designed in 1932. The purpose of the Johnson battery was to measure neuromuscular skill capacity which have ten items. In 1938 Methney studied the test and eliminated six items. The test battery consist of four motor stunts are given below:

I. Front Roll

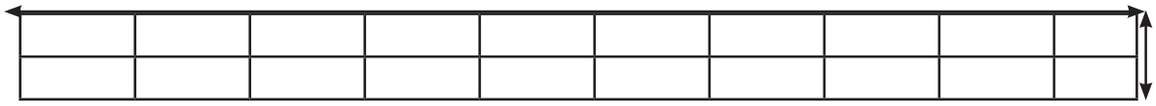
II. Back Roll

III. Jumping Half-Turns

IV. Jumping Full- Turns

Four stunts are to be performed by the boys and three stunts for girls.

Test Area: Mat area length is 15 feet and it is 2 feet wide. The 15 feet length divided in to ten sections for 18" each. The width of transverse line is ¾" and 3" alternatively. Centre of lines remains 18" apart. Another ¾" wide line is marked lengthwise in the middle of the mat area.



Procedure:

1. **Front Roll:** Ignoring the long middle dividing line, the subject is asked to start outside the marked area and perform two front rolls, one up to 7.5' i.e. 3" wide centre line and the second in the other half of 7.5'. The subject is to perform the rolls without touching the limits or over reaching the zones mentioned above.

Scoring: Each correct roll gets 5 points, hence maximum of 10 points. Two points are deducted for over-reaching side line, right or left for each roll; one point is deducted for over reaching the end limit on each roll and full five points are deducted when the subject fails to perform a true front roll

2. **Back Roll:** The test is similar to front roll both in performing and scoring. The subject is to start outside the marked chart area and is to 'perform two back rolls in the 2 feet lane area, one up to first half and the second back roll in the second half.

3. **Jumping Half Turns:** The subject is asked to start with feet on first 3" line, jump with both feet to second 3" wide line, executing a half turn either right or left; jump to third 3" line executing half turn in opposite direction to first half-turn and then to 4th and 5th 3" wide lines executing half turns, right or left alternatively.

Scoring: Perfect execution of four jumps is worth ten points. Only 2 points are deducted for each wrong jump when the subject either does not land with both feet on the 3" line or turns the wrong way or both.

4. **Jumping Full Turns:** The subject is asked to start with the feet outside the marked area at about the centre of the lane. He/She is required to jump with feet together to second rectangular space, executing a full turn with the body either right or left; continue jumping to alternate rectangular spaces across the marked mat executing full turns, rotating body in the same direction, landing on both feet every time.

Scoring: Perfect execution of five jumps is worth ten points. Two points are deducted, if the subject fails to keep balance on landing on both feet; turns too far or oversteps the squares.

I. Tick the correct options.

1. Johnson- Metheny Test battery has _____Items.
   - i. 6
   - ii. 5
   - iii. **4**
   - iv. 10

2. Johnson- Metheny Test battery does not consist of _____motor stunts
   - i. Front Roll
   - ii. Back Roll
   - iii. **Side Roll**
   - iv. Jumping Full- Turns

II. Answer the questions briefly.

1. Explain the procedure of Jumping Half-Turns and Jumping Full- Turns in Johnson – Methney battery.

III. Answer the question in 150-200 words.

1. How can we test Motor Educability? Explain in detail.

IV. Complete the following table about some important tests for assessing physical fitness in school.

Name of Test	What it tests?	Procedure	Scoring
Plate Tapping Test			
Flamingo Balance Test			
Partial Curl up			
Push ups			
Sit and Reach Test			
600m Run			
50m Dash			
Harvard Step Test			
Johnson-Metheny Test			

V. Case Study Questions.

1. Sports department of ABC school is conducting fitness tests for all the students of the school. As studies in chapter test and measurement in sports answer the following questions.

   a. Name the test items for class 1-3.

   b. Name the test items for classes 4-12.

   c. Which tests are common in both the categories 1-3 & 4-12?

2. Students of class X were gathered on the playground during their games period and were informed that a fitness test will be conducted for them. Students had some questions related to the test items.

   a. What is the purpose of conducting Push-ups?

   b. Which test will be conducted for speed?

   c. What is the time duration for performing Partial curl ups?

IV. Art Integration

The Sports department of your school is conducting fitness tests for all the students of the school.

Based on the chapter Test and Measurement in Sports,

Plan tests for

(a) Classes 1-3.

(b) Classes 4-12.

(c) Are there any tests that are common to both the categories 1-3 & 4-12?

(d) Students of class III and X were gathered on the playground during their games period and were informed that a fitness test will be conducted for them. Students had some questions related to the test items.

1. What is the purpose of conducting Flamingo Test/ Push-ups?
2. Which test will be conducted for speed for both categories?

Prepare a short speech informing students about the tests, their objective, procedure and method of scoring.

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