

## Chapter 1 | Management of Sporting Events

### Sports Events

Sports event means a game, match, race or similar competitive event associated with a Governing Body in its entirety or a particular in-game, live occurrence such as, but not limited to, a particular play or score.

### Function of Sporting Events

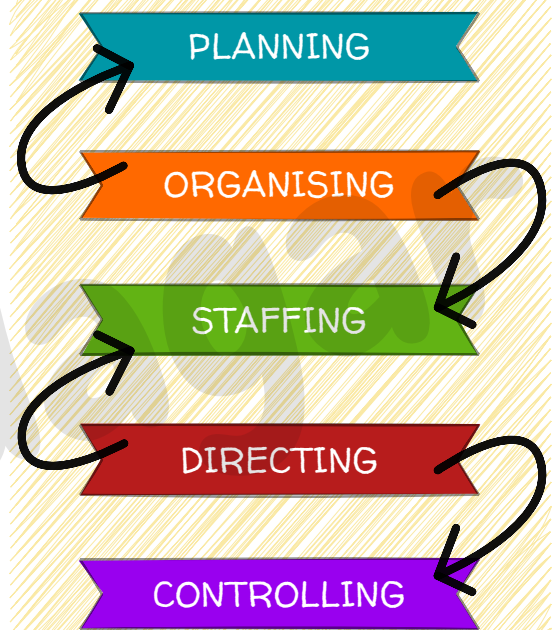
**Planning:** Planning is a process of achieving pre-determined goals and decide what is to be done, how it is to be done, when it is to be done and by whom it is to be done.

**Organising:** Organising is the management function of assigning duties, grouping tasks, establishing authority and allocating resources to carry out a specific plan.

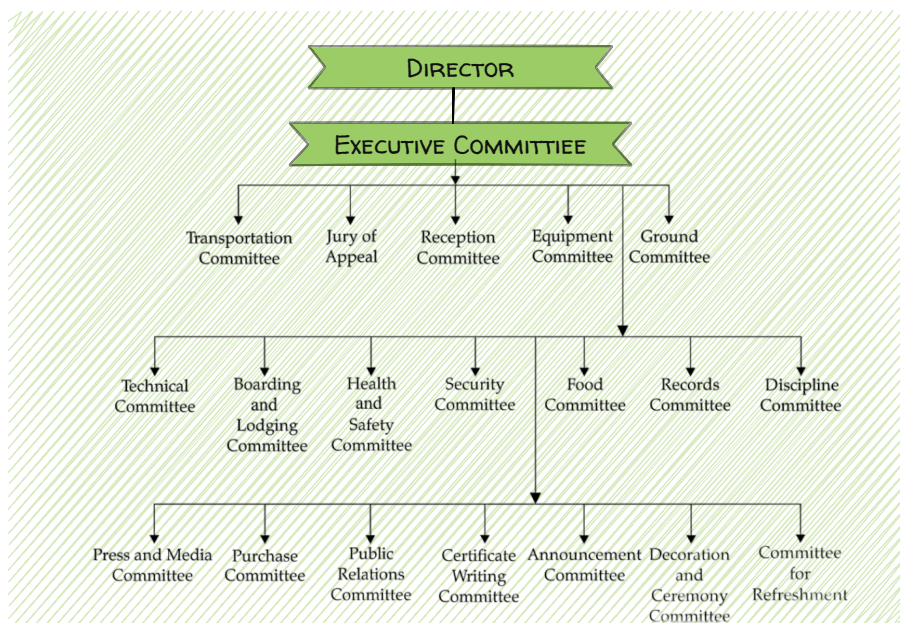
**Staffing:** This function is concerned with finding the right person for the right position at the right time.

**Directing:** Directing is the process of supervising, motivating, leading and communicating with the subordinates to achieve the organisational objectives.

**Controlling:** The task of controlling involves establishing standards of performance, measuring current performance, comparing it with established standards and taking corrective actions, if there is any significant deviation between actual and planned performance.



### Important Committees



## Chapter 1 | Management of Sporting Events

### Important Committees

**Press & Media Committee:** Its main duty is to publish and advertise the sports events.

**Transportation Committee:** Its main responsibility is to make necessary arrangements for transportation.

**Equipment Committee:** This committee is responsible for making the grounds or laying out the track and field.

**Committee for Refreshment:** This committee takes the charge of supplying refreshments and drinks to the guests, officials, competitors, etc.

**Decoration & Ceremonies Committee:** The members of this committee are responsible to welcome the chief guests at the opening and closing ceremonies.

**Reception Committee:** This committee sends entry forms to the various institutions early. It sometimes also prepares fixtures of teams participating in the competition.

**Technical Committee:** This committee selects various officials such as referees, judges, umpires, etc.

**Announcement Committee:** This committee is responsible for making all the announcements during the period of sports events.

**Health & Safety Committee:** This committee provides first aid to the victim or affected sportsman/athlete.

**Finance Committee:** They Prepare Budget for tournaments.

### Important Responsibilities

#### Pre-Responsibilities

1. To finalize a suitable venue for the event.
2. To coordinate with local authorities for necessary permits and permissions for the event.
3. To arrange for parking and transportation options for attendees.
4. To ensure that the venue is properly staffed and equipped to handle the event.
5. To develop a plan for managing the event's media presence
6. To identify potential sponsors & create budget for events.
7. To arrange transportation and accommodation for the participants.
8. to ensure that good medical and first aid services are available at the event.

#### During-Responsibilities

1. To monitor the event and make sure that everything runs smoothly.
2. To manage the volunteers and the staff at the event.
3. To ensure the safety and security of all the participants, attendees, and the staff during the event.
4. To ensure adequate food and beverage for all attendees.
5. To coordinate entertainment and activities at the event.
6. To monitor the event's technology needs and respond to any issues that may arise.
7. To manage the event's media presence and provide information and updates to the media.
8. To ensure medical and first aid services are available at the event

#### Post-Responsibilities

1. To evaluate the event's success & make plans for future events.
2. To generate a final report on the event, with all the feedback, observations, & recommendations for the future events.
3. To review media coverage of the event.
4. To coordinate the breakdown of the event & ensure that all the equipment & resources are returned or stored properly.
5. To collect feedback from the volunteers & the staff and debrief them on their experiences.
6. To review safety and security measures, and identify any potential safety & security issues for future events.
7. Prizes & Certificate gives to participants.



## Chapter 1 | Management of Sporting Events

### Tournament

Tournament is a competition involving a relatively large number of competitors, all participating in a sport or game. Tournament are organised at various levels such as zonal state national and international level

#### Knockout Tournament

Single-elimination, knockout, or sudden death tournament is a type of elimination tournament where the loser of each match-up is immediately eliminated from the tournament. Each winner will play another in the next round, until the final match-up, whose winner becomes the tournament champion.

#### League Tournament

It is also called round robin tournament. In a league tournament, the teams/players are treated at par. Whether the team/player wins a match or loses, the team will get a chance to play with every other team.

Advantages of league tournament. It decides the true winner.

#### Combination Tournament

Combination Tournament are those tournament in which initial round of tournament are played on particular basis (knock-out or league) and rest of the tournament played on another particular basis.

Knockout cum knockout  
League cum league  
Knockout cum league  
League cum knockout

**Seeding:** In this method, teams or individuals are assigned to different brackets or groups based on their performance in the previous tournaments or competitions.

**Method of giving Seed:**  
S-1 : UH (1st Team)  
S-2 : LH (Last Team)  
S-3 : UH (Last Team)  
S-4 : LH (1st Team)  
& So on...

**Special Seeding:** A process to place the stronger team/teams at appropriate places in the fixture and to avoid the elimination of such teams in the first round and give them a chance to participate in quarter-final or semi final.

**Byes:** This method of creating fixtures that allows a certain number of teams or individuals to advance to the next round without having to play a match.

**Method of giving Byes:**  
Bye-1 : LH (Last Team)  
Bye-2 : UH (1st Team)  
Bye-3 : LH (1st Team)  
Bye-4 : UH (Last Team)  
& So on...

### Fixtures

A tournament fixture refers to the schedule or timetable of matches or events that take place during a sports tournament. It is a comprehensive list of all the matches, including the teams playing, the venues, and the dates and times of the matches.

#### Knockout Fixtures

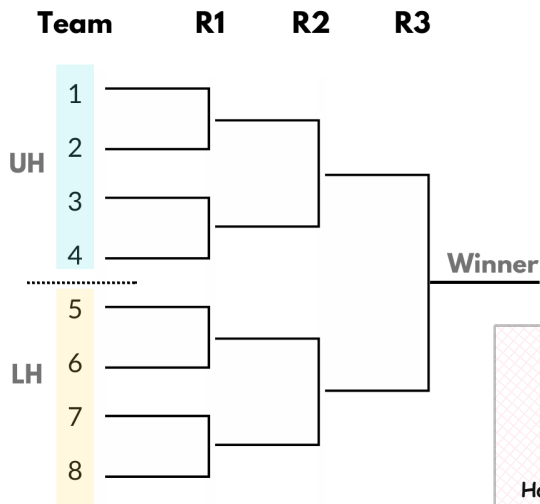
With Byes  
Without Byes  
With Seeding

#### League Fixtures

Cyclic Method  
Staircase Method  
Tabular Method

# Chapter 1 | Management of Sporting Events

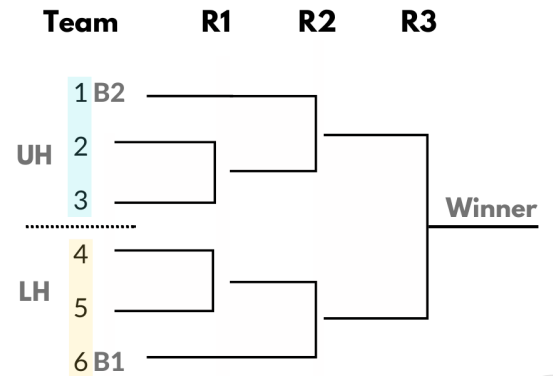
## Even Teams without Byes for 8 Teams



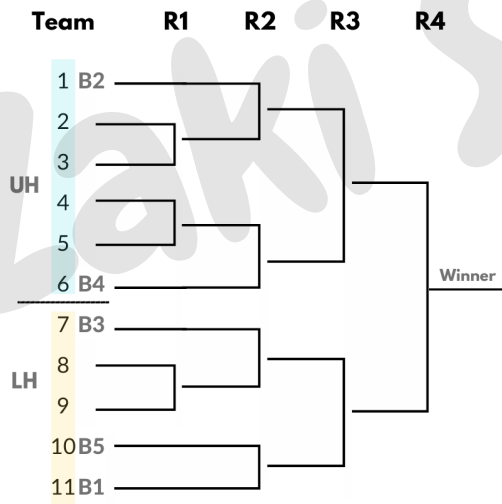
Watch Now

How to Draw Fixtures

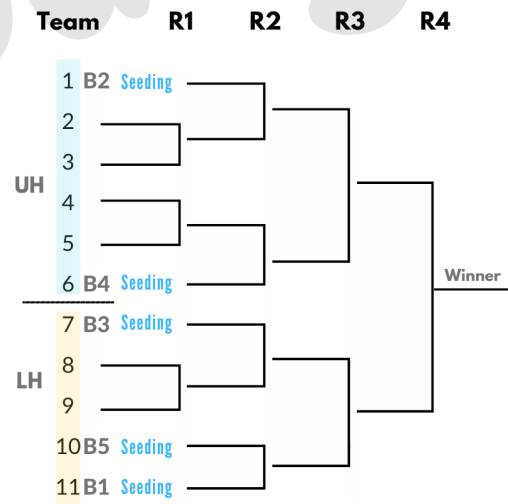
## Even Teams with Byes for 6 Teams



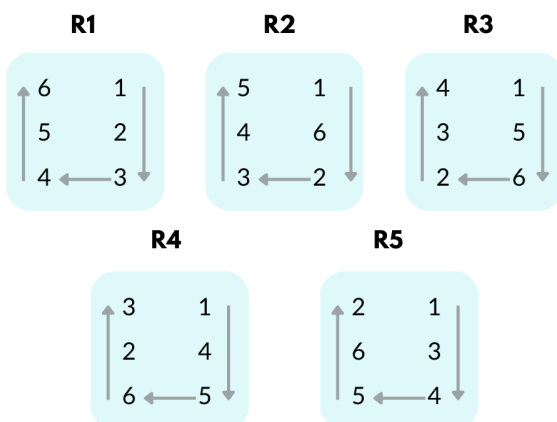
## ODD Teams with Byes for 11 Teams



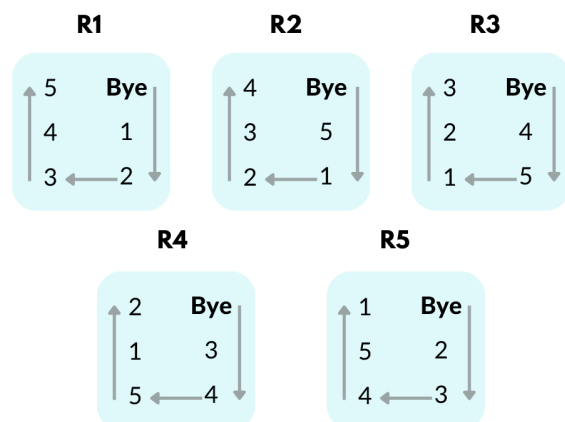
## Even Teams (Seeding) for 11 Teams



## Cyclic Method Even Teams



## Cyclic Method ODD Teams





## Chapter 1 | Management of Sporting Events

### Staircase Method ODD Teams

1-2			
1-3	2-3		
1-4	2-4	3-4	
1-5	2-5	3-5	4-5
R1	R2	R3	R4

### Staircase Method Even Teams

1-2				
1-3	2-3			
1-4	2-4	3-4		
1-5	2-5	3-5	4-5	
1-6	2-6	3-6	4-6	5-6
R1	R2	R3	R4	R5

### Tabular Method Even Teams

	A	B	C	D	E	F
A		1	2	3	4	5
B			3	4	5	2
C				5	1	4
D					2	1
E						3
F						

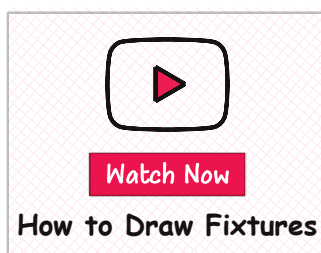
A v/s B  
C v/s E  
D v/s F  
Round 1

A v/s C  
B v/s F  
D v/s E  
Round 2

A v/s D  
B v/s C  
E v/s F  
Round 3

A v/s E  
B v/s D  
C v/s F  
Round 4

A v/s F  
B v/s E  
C v/s D  
Round 5



### Tabular Method ODD Teams

	A	B	C	D	E	F	G	Bye
A		1	2	3	4	5	6	7
B			3	4	5	6	7	2
C				5	6	7	1	4
D					7	1	2	6
E						2	3	1
F							4	3
G								5
Bye								

A v/s B  
C v/s G  
D v/s F  
E - Bye  
Round 1

A v/s C  
D v/s G  
E v/s F  
B - Bye  
Round 2

A v/s D  
B v/s C  
E v/s G  
F - Bye  
Round 3

A v/s E  
B v/s D  
F v/s G  
C - Bye  
Round 4

A v/s F  
B v/s E  
C v/s D  
G - Bye  
Round 5

A v/s G  
B v/s F  
C v/s E  
D - Bye  
Round 6

B v/s G  
C v/s F  
D v/s E  
A - Bye  
Round 7

### Intramural

The word intramural is derived from the Latin words intra and muros, which means 'within walls'. The teams compete within the walls of the institution e.g. inter-class or inter-house tournament within an institution.

The objectives of intramurals are as follows:

1. To provide incentive, motivation and opportunity to learn various skills.
2. To develop sportsman spirit among students.
3. To help in recreation of the students.
4. To improve-social interaction among the students

Significance:

1. It brings out the hidden talent of the students.
2. It develops leadership qualities in students.

### Extramural

This encloses the activities which are performed outside the walls of the institution or school. It means that students of two or more schools participate in such competitions.

1. The objectives of extramural are:
2. To improve the standard of sports.
3. To provide experience to students.
4. To develop sportsmanship and fraternity.
5. To broaden the base of sports.
6. To provide the knowledge of new rules and advanced techniques.

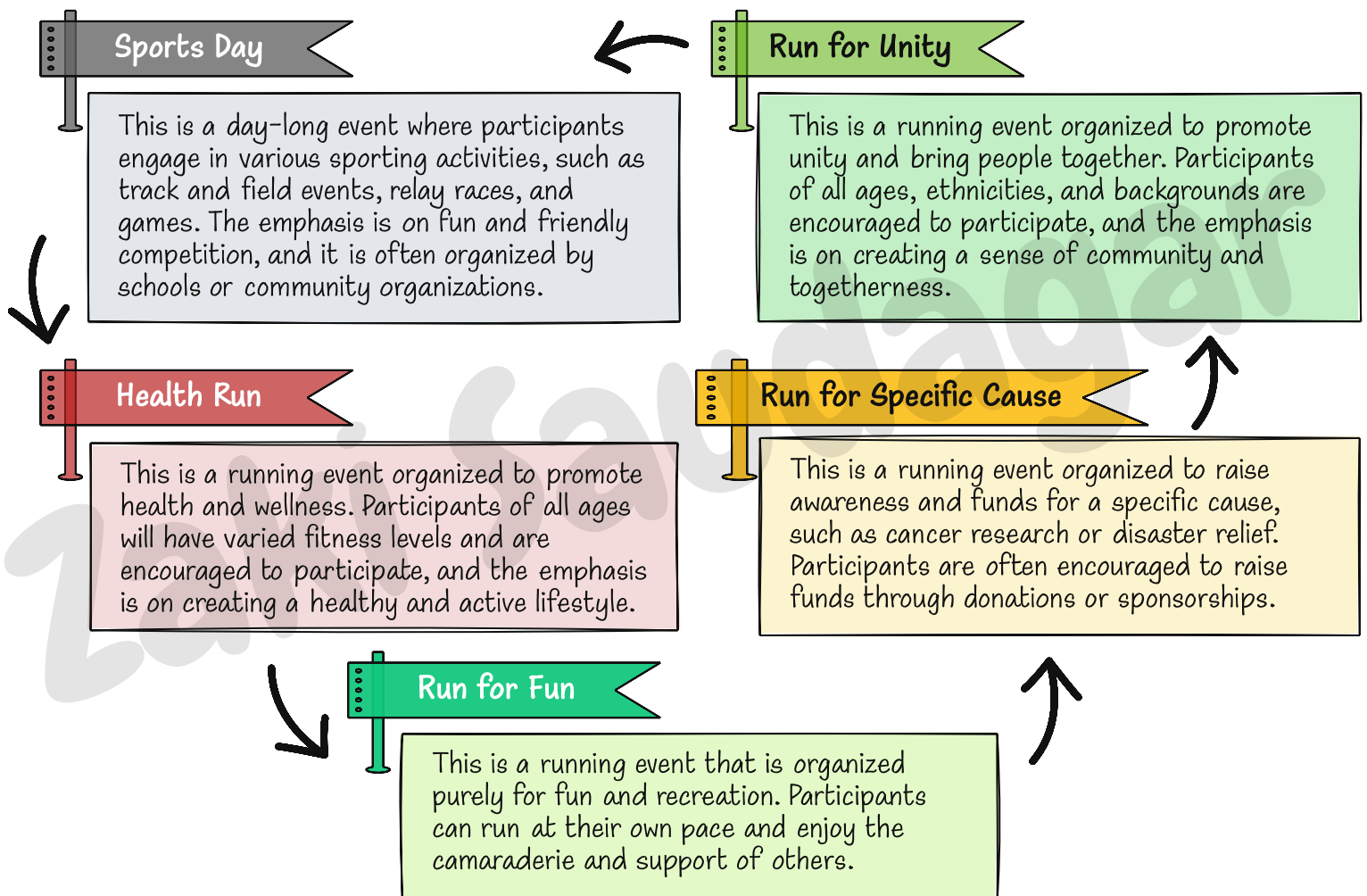
Significance:

1. They provide recreational opportunities for the campus community. ..
2. They give positive experiences, regardless of race, nationality, age and gender.

## Chapter 1 | Management of Sporting Events

### Specific Sports Programmes

Specific sports programmes are those which are not usually related to competitions. The programmes have various objectives like creating awareness, creating a sense of integration among people and raising funds for charitable organisations. Some of these programmes are Sports day, Run for fun, Health run, Run for specific cause, Run for unity and Run for awareness.



## Unit 2 | Children & Women in Sports

### Introduction

Sports are good for children's of all age. Children can enjoy their physical activities by taking part in sports and games. In fact the most important thing is that children's motor development should be according to their requirement.

### Exercise Guidelines of WHO

The World Health Organization (WHO) has published exercise guidelines for different age groups, which are designed to promote health and prevent chronic diseases such as obesity, diabetes, and heart disease. Here are the exercise guidelines for different age groups as recommended by the WHO:

1. For Children under 5 years of Age
2. Children & adolescents aged 5-17
3. Adults aged 18-64 years
4. Adults aged 65 years & Above

### Stages of Life

INFANT (0-1YRS)

TODDLER (2-4YRS)

CHILD (5-12YRS)

TEEN (13-19YRS)

ADULT (20-39YRS)

Middle Adult Age (40-59 yrs)

SENIOR (60+ YRS)

### Children & Adolescents

1. Children and adolescents should engage in at least 60 minutes of moderate-to-vigorous intensity physical activity daily.
2. This can include activities such as running, swimming, cycling, playing sports, and dancing.
3. Muscle-strengthening activities should also be performed at least three times a week, such as push-ups, squats, and lunges.

### Adults (18-64 yrs):

1. Adults should engage in at least 150-300 minutes of moderate-intensity aerobic physical activity per week or 75-150 minutes of vigorous-intensity aerobic physical activity per week.
2. This can include activities such as brisk walking, jogging, cycling, swimming, and dancing.
3. Muscle-strengthening activities should also be performed at least two days a week, such as lifting weights and doing push-ups or sit-ups.

### Older Adults 65+yrs

1. Older adults should engage in at least 150-300 minutes of moderate-intensity aerobic physical activity per week, or 75-150 minutes of vigorous-intensity aerobic physical activity per week, depending on their ability.
2. This can include activities such as brisk walking, dancing, gardening, and cycling.
3. Balance exercises should be performed at least three days a week to prevent falls.



## Unit 2 | Children & Women in Sports

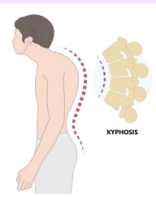
### Posture

Posture is a position in which a person holds his body while standing, sitting, or lying down. It is the body's alignment when sitting, standing, or performing any other activity.

### Common Postural Deformities

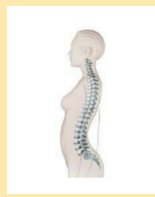
#### SPINAL CURVATURE

##### Kyphosis



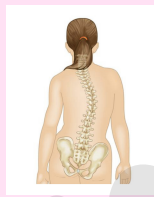
It is usually related to abnormality curve spine. It's most common in older women.  
Causes - Due to malnutrition, heavy load, weak muscle etc  
Remedies - Use pillow under the back while sleeping, perform dhanurasana.

##### Lordosis



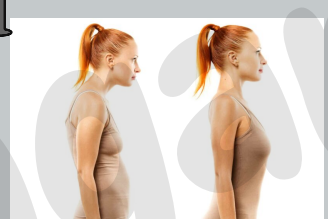
It is usually the inward curvature of spine. Increase forward curvature in the lumbar region.  
Causes - Due to improper development of muscle, obesity, etc.  
Remedies - perform sit ups, perform halasana.

##### Scoliosis



It is a lateral direction deformities also called sideways curvature.  
Causes - Due to under developed legs, paralysis.  
Remedies - bending exercises should be done, swim Bhai using breaststroke techniques.

##### Round Shoulder



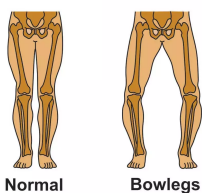
In this postural deformity the shoulder become round and sometime they seem to be band forward.

Causes - due to heredity because of tight cloth.

Remedies - perform chakrasana and dhanurasana

##### Bow Legs

###### Bowlegs

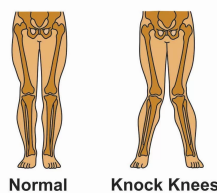


It opposite to knock knee position if there is a wide gap between the knee when standing with feet together the individual has bowleg.

Causes - Deficiency of calcium Phosphorus and bone  
Remedies - vitamin d should be taken, balance diet

##### Knock Knee

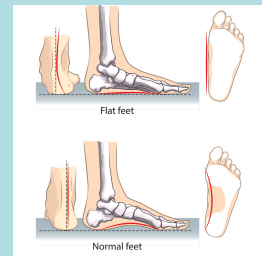
###### Knock Knees



It is one of the major postural deformities in which both the knees knock or touch each other while normal standing position.

Causes - lack of balanced diet specially vitamin d calcium and phosphorus  
Remedies - perform padmasana, gomukhasana.

##### Flatfoot



Flatfoot is a condition that affects the feet, causing them to become flat and painful. Children with flat feet experience pain when they run & struggle to stand and walk.

Causes: Genetics, Age, obesity, diabetes, and certain medical conditions.

## Unit 2 | Children & Women in Sports

### Women Participation in Sports

For women's participation in sports we have a look at ancient period. Regarding participation in the first modern Olympic (1896 Athens), there was no participation of women.

1. Women participated first time in 1900 Olympics. (22 women participated in)  
In 1904 six women participated.
2. After 100 years in 2000 Sydney Olympics 4069 women had participated.
3. In 2008 Beijing Olympics 4637 women participated.

Participation in India:

1. In 2000 karnam Malleswari was the first woman who won bronze medal in Sydney Olympic from India.
2. In 1984 performance of P.T. Usha was very good in Athletics.
3. In 2012 london olympics Saina Nehwal and M.C. Maricom got bronze medal.
4. In 2016, Rio Olympics, Sakshi Malik won bronze medal, P.V. Sandhu won silver medal where as Deepa Karmakar opened new dimensions in gymnastics.

Reasons for the low rate of sports participation by women in India:

Gender equity & social attitude, No parental encouragement, Traditional society, Women constraining other women, Lack of plans & initiatives for sports women by the Government, Male dominant culture, Less availability of women coaches, Less competition, Economic Factor, Media Coverage, Lack of Incentives & Career

Physical Benefits:

Healthy lifestyle, Weight Management, Physical Fitness, Stronger Bones, Delays Ageing, Increases Muscle strength & functions

Psychological Benefits

Help moderate stress, Improve Your mood, Boost mental health, Help with depression, Higher self esteem, Better self image, More self confidence

Social Benefits

Social Empowerment, Team work, Communication Interpersonal Relationship.

### Special Consideration

There are some specific considerations that should be taken care by sportswomen. Some special considerations are menarche and menstrual dysfunction. These are the natural considerations that are present in every women. Girls and women who are active in sports, need to consider these seriously. These considerations are associated with their physiology and also affect their psychology. They are described in detail below:

#### Menarche



Menarche is the girl's first menstrual period or bleeding. It can happen as early as age 9 or upto age 16. The exact period of menarche depends upon the biological, genetic and environmental factors.

As a sportsperson, a young woman has to take special care of herself at that time. It is essential to take proper nutrition during this period, so that the body performs all its functions normally.

#### Menstrual Dysfunction



It means abnormal bleeding and irregular menstrual cycle. Normally, a menstrual cycle lasts upto 3 to 7 days and occurs every 22 to 35 days. During menstrual dysfunction, women often complain of headache, back pain, fatigue, cramps, tiredness, etc. This not only hampers their physical performance but also challenges them psychologically. During these days, women should be more careful about their cleanliness and hygienic habits.



## Unit 2 | Children & Women in Sports

### Female Athlete Triad

The 'Female Athlete Triad' is a syndrome of three related conditions i.e. Osteoporosis, Amenorrhea, Eating Disorders, generally seen in teenage or adult female athletes who aren't meeting their energy requirements properly, which ultimately leaves them undernourished. This also affects their performance severely.

#### Osteoporosis



Osteoporosis is a weakening of the bones due to the loss of bone density and improper bone formation.

Women suffering from this disease lack minerals in their bone contents. Oestrogen is also low. The bones become porous, brittle and break easily. This condition reduces the sports performances and makes a person prone to fractures & injuries.

#### Amenorrhea



Exercising intensely and not taking enough calories can lead to hormonal imbalances that results in a girl's menstrual cycle becoming irregular or stopping altogether. This condition is known as amenorrhea.

Thus, amenorrhea refers to the absence of menstrual periods or becoming irregular. Hair loss, headache, change in vision and development of facial hair are symptoms of amenorrhea.

#### Eating Disorder



It refers to taking very little calories due to which there is deficiency in the body. The deficiency can be of essential nutrients or even lack of energy. Eating disorder is related to mental illness and affects a person's physical and mental health.

To improve athletic performance, most of the female athletes try to lose weight.

For this purpose, they do not eat enough food containing fat and particularly iron, which leads to serious disorders like anorexia nervosa, bulimia nervosa, anaemia, etc.

#### Anorexia Nervosa

It is an eating disorder which causes people to obsess about weight and what they eat. Anorexia is characterised by a distorted body structure, with an unwanted fear of being overweight.

People trying to maintain a below-normal weight through starvation or too much exercise.

#### Bulimia Nervosa

In this disorder female athletes eat excessive amount of food and vomit intentionally in order to not gaining weight.

It is a serious eating disorder marked by bingeing. Bulimia is a potentially life-threatening eating disorder.

People take dangerous steps to avoid weight gain like vomiting (purging), excessive exercising or fasting.



## Unit 3 | Yoga as a Preventive Measures

### Yoga

The term "yoga" comes from a Sanskrit word meaning "union." Yoga combines physical exercises, mental meditation, & breathing techniques to strengthen the muscles and relieve stress.

#### Asanas



According to Patanjali asana means - Sthiram sukham asanam means 'that position which is comfortable and steady'. According to Brahmanopanishad - to sit comfortable position or posture for everlasting period is called asanas. Asana is a means through which physical and mental development is achieved. prevention of diseases and delay in aging are the effect that are achieved through yoga exercises

#### Benefits

1. Bones & joints become strong.
2. Muscles of the body become stronger & the efficiency of muscles also increases
3. Blood circulation is improved & blood pressure normalises and stabilize.
4. The size of the lungs and chest also increases so that the respiratory organ become efficient.
5. Efficiency of the digestive system increases that means the absorption of food become efficient.
6. Nervous system strengthening and increase the neuromuscular coordination also.

#### Content

Obesity: Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Pavanmuktasana, Matsayanasana, Halasana, Pachimottansana, Ardha- Matsyendrasana, Dhanurasana, Ushtrasana, Suryabedhan pranayama

Diabetes: Procedure, Benefits & Contraindications for Katichakrasana, Pavanmuktasana, Bhujangasana, Shalabhasana, Dhanurasana, Supta-va-jarasana, Paschimottanasana, Ardha-Mastendrasana, Mandukasana, Gomukasana, Yogmudra, Ushtrasana, Kapalabhati.

Hypertension: Procedure, Benefits & Contraindications for Tadasana, Katichakrasana, Uttanpadasana, Ardha Halasana, SaralaMatyasana, Gomukhasana, Uttan Mandukasana, Vakrasana, Bhujangasana, Makarasana, Shavasana, Nadishodhanapranayam, Sitlipranayam

Asthma: Procedure, Benefits & Contraindications for Tadasana, Urdhwahastottansana, UttanMandukasana, Bhujangasana, Dhanurasana, Ushtrasana, Vakrasana, Kapalabhati, Gomukhasana Matsyaasana, Anuloma-Viloma

Back Pain and Arthritis: Procedure, Benefits & Contraindications of Tadasana, Urdhwahastootansana, Ardha-Chakrasana, Ushtrasana, Vakrasana, Sarala Masyendrasana, Bhujangasana, Gomukhasana, Bhadrasana, Makarasana, NadiShodhana pranayama








#### Obesity



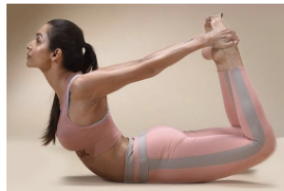


Obesity is that condition of the body in which the amount of fat increases to the extreme level. BMI is helpful for calculating the obesity level.

## Unit 3 | Yoga as a Preventive Measures

### OBESITY

Asanas	Definition	Benefits	Diagram
<b>Tadasana</b>	Tadasana, Mountain pose, or Samasthiti is a standing asana in modern yoga as exercise; it is not described in medieval hatha yoga texts. It is the basis for several other standing asanas	It improves body posture and reduces flat feet problems. Knees, thighs, and ankles become stronger. Buttocks and abdomen get toned.	
<b>Katichakrasana</b>	Katichakrasana literally means rotation of the waist. It gives a nice stretch to the waist and helps in making it more flexible and supple. It takes very little time to do the stretch and it benefits your body in many ways. <b>Kati</b> = Waist; <b>Chakra</b> = Wheel, Circular Rotation; <b>Asana</b> = Posture, Pose	It improves the flexibility of the spine and waist. It is good for relieving constipation. It opens up the neck and shoulders. It helps to relieve back pain.	
<b>Pawanmuktasana</b>	It has three words to it. <b>Pawan</b> =wind, <b>mukta</b> =release or relieve, and <b>asana</b> =posture. So as the name suggests this asana helps in releasing the accumulated wind in stomach and intestines. This pose is a beginner-level, supine <b>Hatha Yoga practice</b> and belongs to the traditional approach to yoga.	It cures acidity, indigestion & constipation. It is helpful for those suffering from arthritis, heart problems & waist and back pain. This is very beneficial for stomach abs. Beneficial for reproductive organs & for menstruation disorder.	
<b>Matsyasana</b>	Matsyasana is a popular yogic asana. In the word 'Matsyasana', <b>Matsya</b> means <b>Fish</b> in Sanskrit. It is named so, since the final posture that the body assumes in this asana resembles a fish. Hence Matsyasana is also called as Fish pose.	It stretches the neck muscles and shoulders. This pose provides relief from respiratory disorders by encouraging deep breathing, as this pose increases lung capacity to a great extent.	
<b>Halasana</b>	Halasana ( <b>Plow Pose</b> ), a full-body stretch that positions your body upside down with your feet over your head, offers interesting new perspectives.	It makes your backbone elastic and flexible. It helps to reduce both belly and body fat. It improves memory power.	
<b>Pachimottasana</b>	Paschimottasana is a Sanskrit name that translates as " <b>west stretching pose</b> ," displaying the sunset of a practice traditionally initiated facing the rising sun	It relieves menstrual discomfort and enhances fertility. It reduces headache, anxiety, insomnia, and sinusitis. It reduces abdominal fats and increases metabolism.	
<b>Ardha – Matsyendrasana</b>	The word "Ardha Matsyendrasana" has been derived from Sanskrit and it translates as "Half Lord of the Fishes Pose".	It improves the functioning of the liver and kidneys. It stretches the shoulders, hips, and neck. It stimulates the digestive enzymes in the belly. It relieves menstrual discomfort	



## Unit 3 | Yoga as a Preventive Measures

<b>Dhanurasana (Bow pose)</b>	Dhanurasana has been named after the shape the body takes while performing it – that of a bow. Dhanu means bow and asana mean posture or pose. Just as a well-strung bow is an asset to a warrior, a well-stretched body helps keep you flexible with a good posture.	Dhanurasana strengthens the back and the abdomen at the same time. It helps improve stomach disorders. It also helps in reducing fat around the belly area.	
<b>Ushtrasana</b>	'Ustra' means <b>camel</b> and 'asana' means <b>posture</b> or seat. Therefore, Ustrasana is often referred to as the camel pose. Camel Pose or Ustrasana is a chest-opening backbend that is energizing and beneficial.	Ushtrasana stretches the anterior muscles of the body. It improves the flexibility of the spine and strengthens it. It improves digestion. It gives relaxation to the lower back.	
<b>Suryabedhan pranayama</b>	Surya Bhedana or Surya Bhedi is a <b>warming/energizing pranayama</b> practiced in a seated meditation posture. Using Vishnu Mudra (hand gesture), you block the left nostril, inhale through the right, retain the breath for as long as you can, and block the right nostril to exhale through the left nostril. The same steps are repeated to perform forced right-nostril breathing.	It activates the body's functions. It is very helpful for increasing digestive fire. It cures all diseases that are caused by the insufficiency of oxygen in the blood.	

### Diabetes






Diabetes is a condition that impairs the body's ability to process blood glucose, otherwise known as blood sugar.

Note: Some asanas are already discussed previously in the chapter.

Asanas	Definition	Benefits	Diagram
<b>Bhujangasana</b>	Bhujangasana or Cobra Pose is a reclining back-bending asana in hatha yoga and modern yoga as exercise. It is commonly performed in a cycle of asanas in <b>Surya Namaskar</b> , Salute to the Sun.	It improves the blood circulation in body. It decreases menstrual irregularities in females. It strengthens muscles of chest, shoulders, arms & abdomen.	
<b>Shalabhasana</b>	Shalabhasana; the locust pose is a cultural asana—for backward bending of the spine. The final position of this Asana resembles a locust or a grasshopper—a strong flier i.e. the instrument to move is strong.	It is beneficial for spinal problems. It is helpful for backache and sciatica pain. Removes unwanted fats around the abdomen & waist.	



## Unit 3 | Yoga as a Preventive Measures

<b>Stupa-Vajrasana</b>	The word Supta Vajrasana comes from the Sanskrit language where 'Supta' means reclined or sleeping, 'Vajra' means thunderbolt, and 'Asana' means pose. It is known as Reclined Thunderbolt Pose in English. People also use terms like Sleeping Thunderbolt Pose and Supine Thunderbolt Pose. It is also known as Supta Virasana (Reclined Hero Pose).	It tones the spinal nerves, makes the rear versatile, & realigns rounded shoulders. It is useful for those stricken by respiratory disorders and different respiratory organ ailments.	
<b>Mandukasana</b>	Mandukasana, or Frog posture is a group of seated asanas in Hatha yoga and modern yoga as exercise, all of which put the body in a shape like that of a frog.	It cures the problems related to stomach. It is beneficial in cardiovascular diseases. It is useful for flexibility of thighs and legs. It reduces extra fat from thighs and hips.	
<b>Gomukasana</b>	It is a combination of three words i.e., go-mukh-asana where "go" refers to cow, "mukh" refers to face and "asana" refers to pose.	It helps in stretching and strengthen the muscles of the ankles, hips and thighs, shoulders, triceps, inner armpits and chest. It is helpful in curing of sciatica. It improves the functioning of lungs.	
<b>Yoga mudrasana</b>	Yoga mudrasana, a <b>deep forward bend</b> , is one of the best anti-aging poses as it helps the practitioner to look and feel younger. From Sanskrit, yoga means "awareness"; mudra means "seal"; and asana means "pose" or "posture." To enter this pose, begin in padmasana (lotus pose)	It stretches the posterior muscles of the trunk and the neck. It improves muscle tone and venous circulation of the spinal column. It has favourable effects on the viscera due to deep intra-abdominal.	
<b>Kapalbhati</b>	Kapalabhati is an important shatkarma, a purification in hatha yoga. The word kapalabhati is made up of two Sanskrit words: kapāla meaning "skull", and bhāti meaning "shining, illuminating".	<ul style="list-style-type: none"> <li>It purifies the frontal air sinuses and stimulates the brain.</li> <li>Massages abdominal organs and improves digestion.</li> <li>It increases the capacity of lungs.</li> <li>It is useful in treating cold, rhinitis</li> </ul>	<p><b>KAPALBHATI PRANAYAMA</b> SKULL SHINING BREATH</p> 







### Hypertension

Hypertension occurs when a person's blood pressure reaches 140/90. This illness may have an effect on the arteries, valves, and other components of the circulatory system. Although it can happen at any age, people between the ages of 30 and 60, as well as those who are obese, are more prone to get it.

Note: Some asanas are already discussed previously in the chapter.

## Unit 3 | Yoga as a Preventive Measures





### HYPERTENSION

Asana	Definition	Benefits	Diagram
<b>Uttana Padasana</b>	There are three Sanskrit terms in Uttana Padasana. In Sanskrit "Uttana" means "intense stretch" or "lying on the back with the face-up", "pada" means "foot" or "leg", and "asana" refers to "pose".	It opens up the chest, contracts the abdomen & stretches the arms and legs simultaneously. It increases the flexibility of internal and external muscles. It relieves stiffness in the lower back, backache, pain in hips and joints.	
<b>Ardh-Halasana</b>	Ardha literally means half and Hala means plough. It is an intermediate posture to perform Halasana hence it is named as Ardh Halasana.	It improves digestion and appetite. It improves blood circulation. It strengthens the thigh muscles and calf muscles. It is helpful to reduce abdomen fat and lose weight.	
<b>Sarala Matsyasana</b>	Matsyasana or Fish pose is a reclining back-bending asana in hatha yoga and modern yoga as exercise.	It is beneficial in cervical, slip disc, spondylitis, sciatica. It is beneficial in all spine-related problems. It stretches the muscles of the legs & hips.	
<b>Makrasana</b>	It is a yoga pose commonly referred to as the crocodile pose. While makar means crocodile, asana means pose.	It is beneficial in cervical, slip disc, spondylitis, sciatica. It is beneficial in all spine-related problems. It stretches the muscles of the legs & hips.	
<b>Shavasana</b>	Shavasana, Corpse Pose, or Mritasana, is an asana in hatha yoga and modern yoga as exercise, often used for relaxation at the end of a session. It is the usual pose for the practice of yoga Nidra meditation, and is an important pose in Restorative Yoga.	It relaxes the whole body. It releases stress, fatigue, depression and tension. It improves concentration and cures insomnia. It helps to calm the mind and improves mental health. It regulates blood circulation.	
<b>Sitali Pranayama</b>	Sitali Pranayama, often called "the cooling breath," is a breath practice that cools the body and has a calming effect on the nervous system. In Ayurveda, Sitali breath is encouraged during the summer months and hottest parts of the day to pacify the heat that builds in your body.	It relieves stress and anxiety through its soothing and relaxing effect. It also helps reduce fever by bringing down body temperature. It helps calm down hunger and thirst in an emergency situation.	

### Asthma

Asthma is the disease of liver lungs in which airway become blocked causing difficulty in breathing. Airways also swell up and produce extra mucus. It usually triggered the coughing sneezing or shortness of breath.



Note: Some asanas are already discussed previously in the chapter.

Asana	Definition	Benefits	Diagram
<b>Urdhva Hastasana</b>	Urdhva Hastasana translates to "Raised Hands Pose," but it is also sometimes called Talasana, the Palm Tree Pose.	It enhances the functioning of the digestive system and increases the capacity of the lungs. This asana helps in improving the blood circulation of the body. It helps in enhancing the body's postures.	
<b>Uttana Mandukasana</b>	Uttana Mandukasana, 'Uttana' means 'Stretched up,' 'Manduka' means 'Frog,' and 'Asana' means 'Pose'.	It gives a good stretch to the upper and lower back muscles, makes back muscles flexible, and relieves back pain and strain. It stretches the elbow joints and is hence good for elbow health.	
<b>Vakrasana</b>	Vakrasana comes from a combination of two words, Vakra which means twisted and asana which means yoga posture. Earlier, Vakrasana was a simplified form of Ardhamatsyendrasana. Vakrasana is among flexible yoga twist poses where twisting is observed in the spinal region and one may also call it a twisted pose or seated twist yoga pose.	<ul style="list-style-type: none"> <li>• It reduces belly fat.</li> <li>• It improves the function of both spinal cord and nervous system.</li> <li>• It controls diabetes and strengthens kidneys.</li> </ul>	
<b>Anuloma Vilom</b>	Anuloma Pranayama is one of several Pranayama or breath exercises used in the practice of Hatha yoga. Anu roughly translates as with and Loma means hair implying "with the grain" or "natural".	<ul style="list-style-type: none"> <li>• Calms and steadies the mind, improves focus and concentration.</li> <li>• Improves blood supply to the brain.</li> </ul>	

## Backpain

"Physical discomfort occurring anywhere on the spine or back, ranging from mild to disabling" Back pain can have causes that aren't due to underlying disease. Examples include overuse such as working out or lifting too much, prolonged sitting and lying down, sleeping in an uncomfortable position or wearing a poorly fitting backpack.

**Note:** Some asanas are already discussed previously in the chapter.

<b>Ardha-Chakrasana</b>	Ardha-chakrasana yoga is also known as "half wheel pose", and this asana is much easier than Chakrasana. A lot of people find it difficult to practice full wheel pose or say Chakrasana, but half wheel pose is known to be a much easier asana to practice every day.	This asana helps to improve your lung capacity. This asana is also helpful to control high blood sugar levels and to stimulate the pancreas. "Ardha Chakrasana" also helps to increase your back and spine muscles. This asana helps to tone your shoulders, things, and waist. This asana helps to relieve shoulder and neck pain.	
<b>Bhadrasana</b>	<i>Bhadrasana</i> is a basic yoga pose suitable for beginners. It is a great asana for meditation as it is comfortable and can be held for extended periods of time. Practicing bhadrasana calms the mind and brings about feelings of groundedness. It also activates the <i>muladhara</i> (root) chakra.	Calms the mind. Activates the Muladhara chakra. Activates the reproductive organs. Stretches ankles and knees. Strengthens and lengthens the spine. Improves and supports digestion	



## Unit 4 | Physical Education & Sports for CWSN

### Adaptive or Disability sports

Adaptive or disability sports are the type of competitive sports that are designed for individuals with disabilities. These sports are slightly different than normal sports as there may be some modifications in the rules or in the equipment to meet the special needs of the participants. For instance, sled hockey allows the use of sleds for players to sit and play the game.

### Special Olympics

Eunice Kennedy Shriver founded the Special Olympics in 1968. The purpose of the Special Olympics is to provide year-round sports training & athletic competition in various Olympic-type sports for youngsters and adults with intellectual disabilities. It provides opportunities for athletes to develop their physical fitness, experience the joy of sportsmanship, and participates in sharing gifts, skills, and friendships with their families, community, and other Special Olympics athletes.

Headquarters - Washington DC.

Motto: "Let me win. But if I can't win, let me be brave in the attempt."

Governing Body: Special Olympics International

1st Time: Chicago, USA (1968)

Recently, Berlin, Germany (2023)

Special Olympic Logo: The logo of Special Olympics is based on the Sculpture 'Joy & Happiness to all Children of the World'.



**Special  
Olympics**

Special Olympic Flame: The torch that is carried out & lit at Special Olympic Games is called as the 'Flame of Hope'.



### Paralympics

Paralympic Games or Paralympics is an international multi-sport event for athletes with a range of disabilities.

The event usually takes place every two years and almost immediately after the Olympic Games.

There are two versions of Paralympic games — Winter and Summer Games. All Paralympic Games are managed by the International Paralympic Committee (IPC).

Athletes who participate have a range of disabilities including impaired muscle power, hypertonia, ataxia, vision impairment, intellectual impairment, etc MOTO "Spirit in Motion" (2004) in Athens.

The previous "Mind, Body, Spirit," (1994).

Governing Body: International Paralympic committee HQ- Bonn, Germany.

1st Time: Rome, Italy Summer (1960)

Recently, Beijing, China (2022)

Paralympics Logo: The three Agitos encircling a central point symbolize motion, emphasise the role of the Paralympic Movement in bringing athletes together from all corners of the world to compete.



Categories:- Paralympics athletes compete in six different disability groups — cerebral palsy, amputee, visual impairment, intellectual disability, spinal cord injuries, and "les autres" [athletes whose disability does not fit into one of the other categories, like Dwarfism].



## Unit 4 | Physical Education & Sports for CWSN

### Deaflympics

Deaflympics is an international Olympic event at which deaf athletes compete. Unlike other paralympic events, deaf athletes cannot be guided by sounds like referee whistle, gunshot etc. Therefore, special arrangements are made for the deaf athletes at Deaflympics such as waving a flag, using light instead of gunshots etc. The Deaflympics are more than just the world's second oldest multiple sports after olympics. These games are the world's fastest growing sports events. The Deaflympics are an equivalent to the Olympic games for deaf athletes.

**MOTTO:**  
"PER LUDOS AEQUALITAS" (Equality through sport) and sticking to the ideals of the Olympics

The main purpose of Deaflympics is to provide opportunities to person with hearing disability to participate in elite sports. The eligibility criteria to compete at the Deaflympic Games the athletes must have a hearing loss of minimum 55 decibel in their better ear. Hearing aid, cochlear implants etc. are not allowed to be used in the competition.

#### Deaflympics Logo:

It's logo is inspired by the sign for Olympics. The circle in the middle represents an eye because deaf people are very visual. The four colours of the logo i.e. red, green, yellow and blue represent the four regional confederations of the International Committee of Sports for Deaf viz. Europe, Asia Pacific, Pan-America and Africa. It ties together the strong elements, sign language, deaf and international cultures, unity and continuity.



1st time: Paris (1924)  
Recently, Brazil (2022)

### Divisioning in Sports

The concept of Classification and Divisioning is a process used in disability sports for providing even and fair competition for athletes with disability through grouping of athletes. The purpose is very much similar to grouping system used in mainstream sports according to their age-group, gender, weight etc.

### Classification in Parlympics

1. Paralympic Games, IPC has developed classification process which can contribute "to sporting excellence for all Athletes and sports in the Paralympic Movement, and providing equitable competition.
2. Classification is undertaken to ensure that an Athlete's impairment is relevant to sport performance, & to ensure that the Athlete competes equitably with other Athletes" with fair chance to all participant athletes engaging in competitive sports.
3. According to the IPC, the classification process serves 2 roles. The 1st is to determine who is eligible & the second is to group sportspeople for the purpose of competition.
4. The eligibility minimum is an impairment that limits the sports persons ability to participate in an activity & the disability needs to be permanent in nature.

## Unit 4 | Physical Education & Sports for CWSN

### Classification Process

The 1st step is generally a medical assessment.  
The 2nd is generally a functional assessment which involves two parts: first observing a sportsperson in training and then observing the sportsperson in competition.

There are a number of people involved in this process beyond the sportsperson, including individual classifiers, medical classifiers, technical classifiers, a chief classifier, a head of classification, a classification panel and a classification committee.

### Eligible impairments

1. Impaired muscle power
2. Impaired passive range of movement
3. Loss of limb or limb deficiency
4. Leg-length difference
5. Short stature
6. Hypertonia
7. Ataxia
8. Athetosis

### Classification in Deaflympics

Special Olympics uses a competitive-level matching or grouping referred to as 'divisioning', which is a fundamental rule at Special Olympics.

Athletes in competitions are matched with others of the same gender, about the same age and most importantly, of about the same competitive ability.

The fundamental difference between Special Olympics competitions and those of other sports organizations is that athletes of all ability levels are encouraged to participate, and every athlete is recognized for his/her performance.

Competitions are structured so that athletes compete with other athletes of similar ability in equitable divisions.

### Inclusion in Sports

Inclusion is an educational practice where every person can participate equally in all social processes. It is an approach to educating students with special educational needs.

In this inclusion approach, students with special needs are fully integrated into the general education classrooms at a school.

### Implementation of Inclusive education

1. Proper support is provided in case students experience difficulties.
2. Students should feel that they have somebody to speak to when they are worried
3. All students are equally valued.
4. Teachers should make sure that all students participate and learn.
5. The school should monitor the participation, and achievement of all students.
6. Teaching must be planned with all students in mind as per their abilities.
7. Teaching lessons must encourage the participation of all students.
8. Ensure that every student is actively involved  
Students are encouraged to support each other in learning

### Need of Inclusion Education

1. The need for Inclusion is very much there to improve the motor skills of students with disabilities.
2. Institutions need to provide equal chances to every disabled student to participate as per their abilities to boost their confidence level.
3. Normal students get a chance to increase friendships with disabled children. Diversified teaching strategies benefit all students. Children with disabilities learn more from other students, which develops their social and communication skills.



## Unit 4 | Physical Education & Sports for CWSN

### Strategies to make Physical Activities assessable for CWSN

1. **Medical Check-up:** If we want to make physical activities accessible for CWSN, we need to understand the type of disabilities of children. For this purpose, a complete medical check-up of the children is required. With help, PE teachers will have difficulty knowing about the type of disability the child is facing.
2. **Assistive Technology:** It refers to making equipment, devices, or tools that help these children to participate in learning activities like balls with bells, bigger balls, balls attached to strings to bring them back to the students, etc.
3. **Creating a Specific Environment:** This means creating a friendly environment by keeping in mind the specific requirements of disabled children. It shows that they are also required in society, and like other children their age, they can play. Students with special needs can be provided with specific play areas with special requirements as needed by them.
4. **Activities Based on Interests:** Physical activities must be based on the interests, aptitudes, abilities, previous experiences, and limitations of children with special needs.
5. **Modification of Rules:** Rules can be modified according to the needs of the children. They can be provided extra time or attempt to perform physical activity.
5. **Children's Previous Experience Must be taken into consideration:** For making physical activities more accessible for children with special needs, the concerned teacher of PE should have an understanding and knowledge of children's previous experience with physical activities.
6. **Specialized Equipment:** The size, weight, shape, and colour of the playing equipment also have to be customized. Visually handicapped children need brightly coloured equipment, while those with weak muscles need lighter design of equipment.

### Advantages of Physical activities for CWSN

1. **Reduce depression & stress:** Physical activities may help reduce depression in children with disabilities. It also reduces their anxiety and stress levels.
2. **Improve social interaction:** Physical activities provide children with ample opportunities for social interaction. Their social relations improve during involvement in these activities. Different types of sports activities lead to increased social integration, friendship, and bonding.
3. **Many Cognitive benefits:** Physical activities lead to cognitive skills such as thinking, reasoning, and remembering. It enables them to discover and access strengths that cannot be challenged in the classroom setting.
4. **Fun activities:** Physical activities lead to mood benefits. They enjoy social interaction with both the fitness staff and other participants.
5. **Increased fitness & Strength levels:** Children improve their muscle strength, coordination, and flexibility through regular physical activities. It also enhances better motor skills, balance, and body awareness.
- Improve health quality:** Children have positive health and quality of life changes and raise their self-esteem.

## Unit 5 | Sports and Nutrition

### Balanced Diet

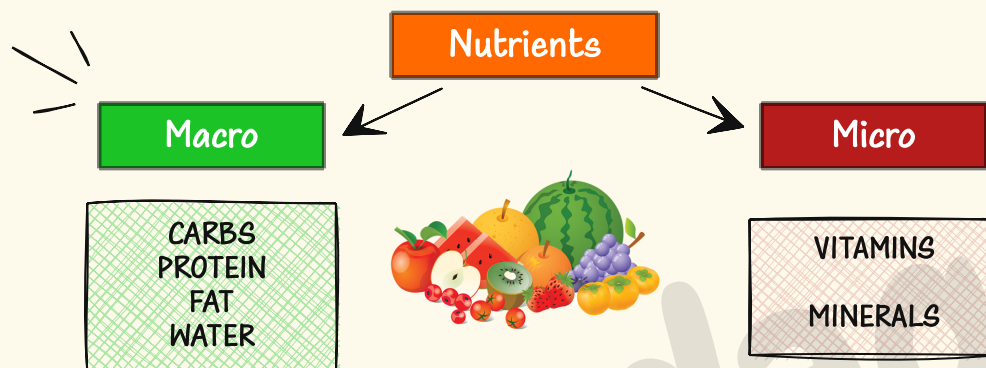


A diet which consists of all essential food constituent viz , protein, carbohydrate, fat, vitamins, minerals and water in correct proportion is called balanced diet

### Nutrition



Nutrition is is a dynamic process which comprises consumption of food to remain healthy and it is essentially the process of nourishing or being nourished.



### Nutritive Component of Diet

CARBS  
PROTEIN  
FAT  
VITAMINS  
MINERALS

&

### Non- Nutritive Component of Diet

FIBERS / ROUGHAGE  
WATER  
COLOR COMPOUND  
FLAVORS  
PLANT PRODUCTS

### Carbs



It is the most important source of energy , it contain the element of carbon hydrogen and oxygen carbohydrate are actually the organic compound that are important for different digestive operation in our body.

Simple carbohydrate - These are soluble in water and are crystalline in nature they are sweet interest and are called sugar Ex - glucose fructose sucrose lactose etc.

Complex carbohydrate - These are not soluble in water and they are not sweeter in taste also it is not a crystalline. Ex - starch ,glycogen and cellulose

### Protein



It contain carbon hydrogen oxygen nitrogen and sometime sulphur they are large molecules so that they cannot directly absorbed into our blood they are turned into amino acid by our digestive system. Body required only 0.36 gram of protein per pound of the ideal body weight.

### Fats



Fat contain carbon Oxygen and hydrogen . It keep us warm and protect our organs and also help in production of hormones.

Types of fat -

Saturated fat - it will increase of cholesterol in body

Unsaturated fat - it will lower the level of cholesterol in our body

### Water



It is made up of hydrogen and oxygen it will help in transportation of nutrient to the cell of the body and also important for the excretion of waste product.

It will also regulate the body temperature and play a vital role for various chemical reaction take place in our body.

## Unit 5 | Sports and Nutrition

### Minerals

Mineral (nutrient) In the context of nutrition, a mineral is a chemical element required as an essential nutrient by organisms to perform functions necessary for life.

Macro minerals : Calcium , potassium , sodium , magnesium , phosphorus

Micro minerals : Iodine , iron , chromium , copper , cobalt

Type of Vitamin	Function	Examples of Ingredients
Calcium	Bone health, normal blood pressure, muscle contraction	Broccoli, dairy products, salmon
Chloride	Maintains fluid and electrolyte balance	Baking soda, bread, cheese, eggs
Chromium	Carbohydrate metabolism	Cheese, fish, meat
Copper	Electron carrier	Cocoa, organ meat, seafood
Fluorine	Bone and tooth health	Organ meat, legumes, nuts
Iron	Part of haemoglobin, a red protein that carries oxygen in the blood	Cereals, breads, egg yolks, fish, fruits
Magnesium	Muscle activity, and fat, protein and carbohydrate metabolism	Brown rice, cocoa, seafood, vegetables
Manganese	Brain function, energy metabolism, building proteins and bone structure	Fruits, vegetables, nuts
Molybdenum	Purine degradation and formation of uric acid	Peas, bread, grains, nuts
Phosphorus	Bone and tooth health	Bananas, citrus fruits, meat, milk
Potassium	Maintains fluid and electrolyte balance	Bananas, citrus fruits, potatoes
Selenium	Antioxidant	Dairy products, fruits, fish
Sodium	Maintains fluid and electrolyte balance	Milk, salt, spinach
Zinc	Taste perception	Red meat, seafood, legumes

### Vitamins

They are the chemical which are required in very small amount to keep our body healthy.

Fat Soluble vitamins :

Vitamin A , Vitamin D , Vitamin E , Vitamin K

Water soluble vitamins

Vitamins B complex : Vitamin

B1,B2,B3,B5,B6,B12,B9,B7 & Vitamin C

Type of Vitamin	Function	Examples of Ingredients
Vitamin A	Vision and cell development in the body	Sweet potato, mangoes, eggs
Vitamin B1	Energy metabolism and nervous system function	Tuna, whole grains, pork
Vitamin B2	Energy metabolism and normal vision	Mushrooms, whole grains, milk
Vitamin B3	Energy metabolism	Whole grains, milk, eggs, meat
Vitamin B5	Energy metabolism	Mushrooms, avocado, beef, poultry
Vitamin B6	Synthesis in new cells	Green leafy vegetables, fruits, fish
Vitamin B7	Energy metabolism	Nuts, egg yolk, liver, fish
Vitamin B9	Synthesis in new cells	Green leafy vegetables, legumes, liver
Vitamin B12	Synthesis in new cells	Lamb, oysters, sardines
Vitamin C	Immunity and formation of collagen in skin	Citrus fruits, strawberries, tomatoes, potatoes
Vitamin D	Maintains calcium and phosphorus in blood	Fatty fish, fish liver oils, eggs
Vitamin E	Antioxidant	Nuts, green leafy vegetables, fish
Vitamin K	Blood clotting	Spinach, green leafy vegetables

Vitamins	Deficiency disorder
Vitamin A (Retinol)	Loss of vision ( <b>Blindness</b> ).
Vitamin B <sub>1</sub> (Thiamine)	Weak muscles and severe weight loss ( <b>Beriberi</b> ).
Vitamin B <sub>2</sub> (Riboflavin)	Poor diet and mouth sores ( <b>Ariboflavinosis</b> ).
Vitamin B <sub>3</sub> (Niacin)	Diarrhea and dermatitis ( <b>Pellagra</b> ).
Vitamin B <sub>5</sub> (Pantothenic acid)	Ischemic attacks and multiple sclerosis <b>affect brain (Paresthesia)</b> .
Vitamin B <sub>6</sub> (Pyridoxine)	Low number or lack of red blood cells ( <b>Anemia</b> ).
Vitamin B <sub>7</sub> (Biotin)	Red and itchy skin ( <b>Dermatitis</b> ).
Vitamin B <sub>9</sub> (Folic acid)	Immature RBCs in the bone marrow ( <b>Megaloblastic anemia</b> ).
Vitamin B <sub>12</sub> (Cyanocobalamin)	Abnormal absorption in the small intestine ( <b>Pernicious anemia</b> ).
Vitamin C (Ascorbic Acid)	Bleeding gums and swollen joints ( <b>Scurvy</b> ).
Vitamin D (Calciferol)	Weakening of bones near joints ( <b>Rickets</b> ).
Vitamin E (Tocopherols)	Faster depletion of RBCs from the body ( <b>Hemolytic anemia</b> ).
Vitamin K (Phylloquinone)	Irregular and slow blood bleeding and clotting ( <b>Bleeding diathesis</b> ).

### Roughage

Aka: Fibres. It mainly consists of water, thus adding volume to the food by improving intestinal function and controlling hunger. It does not cause constipation and helps resolve large intestine disorders. These fibers help in reducing certain cancers and heart diseases.

### Color Compound

At present foods are made more attractive by using various color compounds or pigments in many foods and dishes, which are also appetizing. There are also colors produced from animal products and natural color pigments produced from fruits and vegetables.

### Flavors

Nowadays, foods are made more flavorful and attractive by extracting and producing the essence from various other chemical products which has harmful effects on health. The flavor compounds are produced from both nutritive and non-nutritive components.

### Plant Product

These are compounds extracted from plants that are non-nutritive substances. Some of these components have a good effect on health, like preventing cancers, whereas some have harmful effects when taken in excess.



## Unit 5 | Sports and Nutrition

### Healthy Weight

Healthy weight is considered to be the one that is between 18.5 and 24.9 according to BMI. If the BMI is between 25 and 29 an adult is considered overweight. If the BMI is 30 or greater the person is considered to be obese.

$$\text{BMI} = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

### Food Intolerance

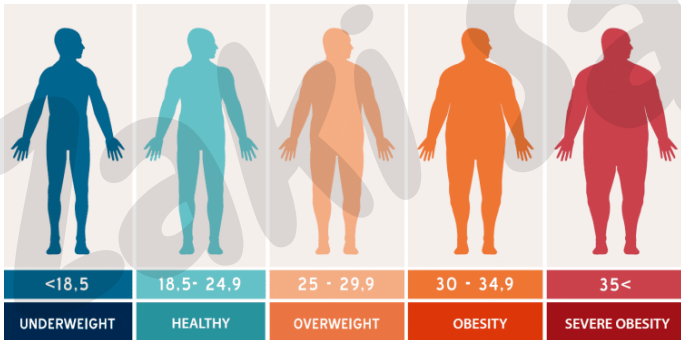
It means the individual element of certain foods that cannot be properly preceded and absorbed by our digestive system.

Causes - Because of the absence of activities of enzyme responsible for breaking down and absorbing the food element.

Symptoms - stomach pain vomiting headache nervousness

### Method to control healthy body :

1. Set an appropriate goal for weight loss
2. Cut your calories and live in active lifestyle
3. Do regular exercise like gym yoga
4. Avoid fatty foods junk foods and fast foods
5. Do not eat smaller meals frequently
6. Balancing the intake of calories and expenditures of calories



### Pitfall of Dieting

Common Pitfalls of Dieting for an Event. Diets that severely restrict caloric intake may offer results, but they trigger a "starvation response" in which the body slows down its metabolic rate to conserve energy. The loss of muscle tissue is responsible for lowering our metabolic rate.

- Extreme reduction of calories and skipping meals
- Restriction of several meals in our dieting like carbohydrate and fat
- Intake of calories through beverages like drinks.
- Not exercising regularly in the dieting

### Food Myths

'There are several food methods which are prevailing not only in India but all over the world.'

1. Potato make you fat
2. Fat free product will help you in losing weight
3. Eggs increases cholesterol level
4. Drinking while eating make you fat
5. Don't take milk immediately after eating the fish

### Importance of Diet in Sports

Diet plays a pivotal role in an athlete's performance and overall well-being. Proper nutrition is essential during all stages of sports, including preparation, competition, and recovery.

#### Pre-Competition Diet

Before the event, athletes should focus on consuming nutrient-rich foods to optimize energy levels and endurance.

- Carbohydrates should be the mainstay, providing a steady source of fuel for muscles.
- Lean proteins aid in muscle repair and recovery while also supporting immune function.
- Adequate hydration is crucial.
- Athletes should aim to maintain optimal fluid levels.

#### During Competition Diet

Staying hydrated is paramount during sports activities to prevent performance decline. Easily digestible carbohydrates, like sports drinks and energy gels, help maintain energy levels. Some athletes may benefit from consuming small, easily digestible snacks during prolonged events.

#### Post Competition Diet

- After the competition, recovery is a top priority to replenish depleted nutrients and repair muscles.

- Consuming a combination of carbohydrates and proteins within the first 30 minutes is vital for muscle glycogen restoration and repair.

- Antioxidant-rich foods aid in reducing inflammation and supporting the immune system.

- Hydration continues to be essential, as athletes lose significant amounts of fluid during intense activities.

## Unit 6 | Test & Measurements in Sports

### Fitness Test — SAI Khelo India Fitness Test in school:

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 a person fit for another. Fitness is generally divided into specific fitness categories or components, and each can be tested and trained individually.

Age group 5-8 yrs/ class 1-3

BMI, Flamingo Balance Test, Plate Tapping Test

Fitness Test

Age group 9-18 yrs/ 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).

#### BMI

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. The test performed is Body Mass Index (BMI), which is calculated from body Weight (W) and Height (H) such as:

$$\text{BMI} = \frac{\text{weight in kg}}{(\text{height in m})^2}$$

Where: W = body weight in kg & H = height in m. The higher the score usually indicating higher levels of body fat.

Equipments Required:

Flat, Clean surface, Weighing Machine, Stadiometer/Measuring Tape pasted on a wall

#### Plate Tapping

Purpose: It measures speed & coordination of limb movement of children.

Equipment: 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 & forth between the discs over the hand in the middle as quickly as possible. This action is repeated for 25 full cycles (50 taps).

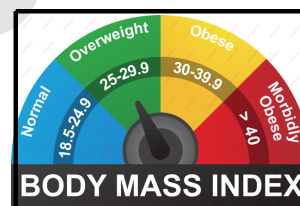


Plate Tapping Method



Flamingo Balance Test

#### Flamingo Balance

Purpose It measures the 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.

Equipment Required: Non-Slippery even surface, Stopwatch, can be done just standing on the 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 is 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.



## Unit 6 | Test & Measurements in Sports

### 50m Standing Test

**Purpose** - to determine the speed.  
**Equipment** - measuring tape or Marked track , Stopwatch  
**Procedure** - The test involves running a single maximum sprint over 50 meters, with the time recorded. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other.

### Abdominal Curl Test

**Purpose** - To test the strength and endurance of abdominal muscles  
**Equipment** - a flat clean and cushioned surface, recording sheet  
**Procedure** - The starting position is lying on the back with the knees flexed and feet 12 inches from the buttocks. The feet cannot be held or rest against an object. The arms are extended and are rested on the thighs. The head is in a neutral position. The subject curls up with a slow controlled movement, until the student's shoulders come off the mat two inches, then back down again. One complete curl-up is completed every three seconds (1.5 seconds up and 1.5 seconds down, with no hesitation), and are continued until exhaustion (e.g. the subject cannot maintain the rhythm). There is no pause in the up or down position, the curl-ups should be continuous with the abdominal muscles engaged throughout

### Pushup Test-Boys

**Purpose** - To measure upper body strength & endurance  
**Equipment** - floor mat record sheet  
**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 angle to the body. Keeping the back and knees straight, the subject lowers the body to a predetermined point, to touch the ground or 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 without rest, and the test continues until exhaustion, or until they can do no more in rhythm or have reached the target number of push-ups.

### 600m Run Test

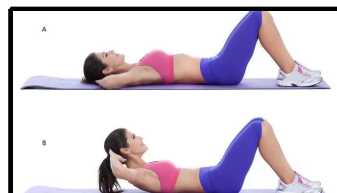
**Purpose** - To measure endurance  
**Equipment** - 600 metre track and stopwatch  
**Procedure** - the subject clicks the position of standing right behind the starting line. At the signal of ' GO ' the subject starts running 600 yard distance. Time is recorded in minute and seconds

### Sit and Reach

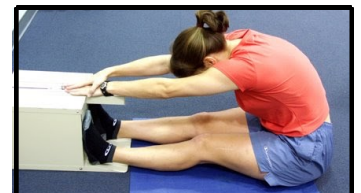
**Purpose** - to measure the flexibility of hip region including back and hamstring  
**Equipment** - Sit and reach box  
**Procedure** - This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the box. Both knees should be locked and pressed flat to the floor, the tester may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, 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.

### Pushup Test-Girls

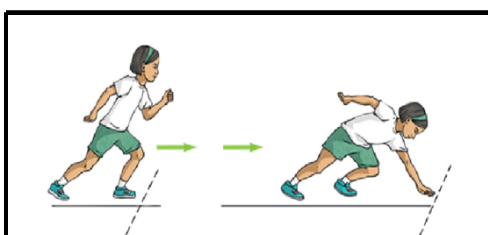
**Purpose** - to measure the upper body strength & endurance  
**Equipment** - set and reach box  
**Procedure** : Begin in a kneeling position on a mat with hands below shoulders and knees behind hips so back is angled and long. Tuck toes under, tighten abdominals, & bend elbows to lower chest toward the floor. Keep your gaze in front of your fingertips so neck stays long. Press chest back up to start position. Repeat for desired number of repetitions.



Abdominal Curl Test



Sit & Reach Test



50m or 600m Test



Push-Up Test



Modified Push-Up Test



## Unit 6 | Test & Measurements in Sports

### Measurement of Cardio-Vascular Fitness

Cardiovascular fitness refers to the ability of our heart, lungs & organs to consume, transport and utilize oxygen. The maximum volume of oxygen our body can consume and use is our  $\text{VO}_2\text{Max}$ . When we exercise regularly, we can increase our cardiovascular fitness as our heart becomes more efficient at pumping blood and oxygen to the body, & the body becomes more efficient at using that oxygen.

#### Harvard Step Test

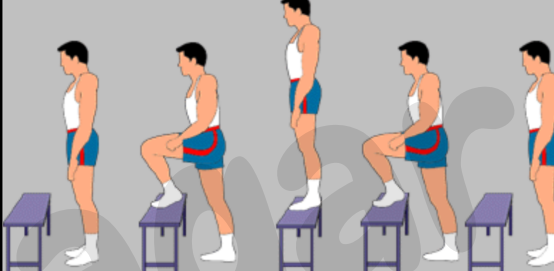
The purpose of this test is to predict a client's aerobic fitness using a simple test with minimal equipment.

Equipment required: Step or platform 50.8 cm high, stopwatch, metronome or cadence tape.

Procedure: The client steps up onto, & back down from the step at a rate of 30 completed steps per minute (one second up, one second down) for 5 minutes or until exhaustion. Exhaustion is defined as when the client cannot maintain the stepping rate for 15 continuous seconds. The client immediately sits down on completion of the test, and the total number of their heart beats are counted from 1 to 1½ minutes after finishing and from 2 to 2½ minutes after finishing and finally from 3 to 3½ minutes after finishing. The client's heart beats are counted through feeling the client's pulse at their wrist.

Scoring: the client's fitness index score is then determined by the following equations.

Fitness Index =  $(100 \times \text{test duration in seconds}) \div (2 \times \text{sum of heart beats in the recovery periods})$



Rating	Fitness Index
Excellent	>90
Good	80-89
High average	65-79
Low average	55-64
Poor	<55

### Basal Metabolic Rate (BMR)

Basal Metabolic Rate (BMR) is the number of calories our body needs to accomplish its most basic (basal) life-sustaining functions such as breathing, circulation, nutrient processing and cell production. Around 60–75% of our daily calories are burned during these processes.

It is the rate of one's metabolism when waking up in the morning after fasting during sleep.

The BMR is enough energy for the brain and central nervous system, heart, kidneys, liver, lungs, muscles, sex organs, and skin to function properly.

In fact, their BMR is usually faster to accommodate for extra fat and for their body to work harder to perform normal body functions. Building lean muscle mass can increase BMR, but there is a limit for both men and women as to how much lean muscle mass can be built. Some supplements may increase BMR, but also only to a limit, and they may have serious side effects.

- For men:**  $\text{BMR} = 88.362 + (13.397 \times \text{weight in kilograms}) + (4.799 \times \text{height in centimetres}) - (5.677 \times \text{age in years})$
- For women:**  $\text{BMR} = 447.593 + (9.247 \times \text{weight in kilograms}) + (3.098 \times \text{height in centimetres}) - (4.330 \times \text{age in years})$

## Unit 6 | Test & Measurements in Sports

### Rikli and Jones test [ For Senior Citizen ]

The Rikli & Jones Senior Fitness Test is a standardised assessment tool used to evaluate the physical fitness of older adults aged 60 years and older. The test includes physical performance measures, including strength, flexibility, balance, endurance and coordination. The results can be used to identify areas of physical fitness that need improvement and to develop personalised exercise programs to help seniors maintain or improve physical health.

#### Chair Stand Test



**Purpose** - To measure the lower body strength

**Equipment** - chair with the straight back and seat of at least 44 cm & stopwatch

**Procedure** : The person stands up from the chair and sits down again as many times as possible in a given time frame, usually 30 seconds. The movements should be smooth and controlled, without using the arms to push off the chair or to balance. The feet should always stay in contact with the floor. Repeat the test 2 times on each leg.

#### Arm Curl Test



**Purpose** - To measure the upper body strength and endurance

**Equipment** - 5 pound weight for women and 8 pound weight for men, chair without arms and stopwatch

**Procedure** : The arm must be fully bent and then fully straightened at the elbow. The protocol for the AAHPERD test describes the administrator's hand being placed on the biceps, and the lower arm must touch the tester's hand for a full bicep curl to be counted. Repeat this action as many times as possible within 30 seconds.

#### Chair Sit & Reach

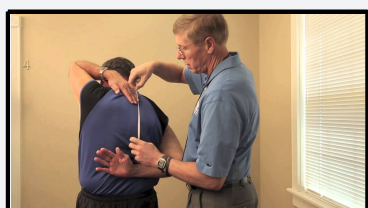


**Purpose** - To measure the flexibility of lower body

**Equipment** - A sturdy chair without arms, a ruler or measuring tape & a flat surface are required for the test.

**Procedure**: The person reaches forward along the ruler or measuring tape with both hands, keeping the legs straight and the feet flat on the floor. The person should reach as far as possible without bending the knees and hold the position for at least 2 seconds. The distance reached is recorded in centimetres or inches.

#### Back Scratch Test

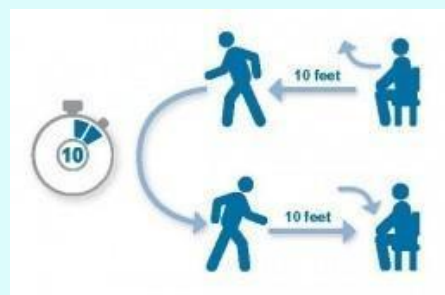


**Purpose** - To measure the flexibility of shoulder or upper body

**Equipment** - ruler back scratch test

**Procedure** : This test is done in the standing position. Place one hand behind the head and back over the shoulder, and reach as far as possible down the middle of your back, your palm touching your body and the fingers directed downwards.

#### Eight foot up & go Test



**Purpose**: This test measures speed, agility and balance while moving.

**Equipment required**: stopwatch, straight back or folding chair (about 17 inches), cone marker, measuring tape, area clear of obstacles.

**Procedure**: The person stands up from the chair, walks forward three metres, turns around and walks back to the chair. The time taken is recorded using a timer. The movements should be smooth and controlled, without excessive speed or hurry.



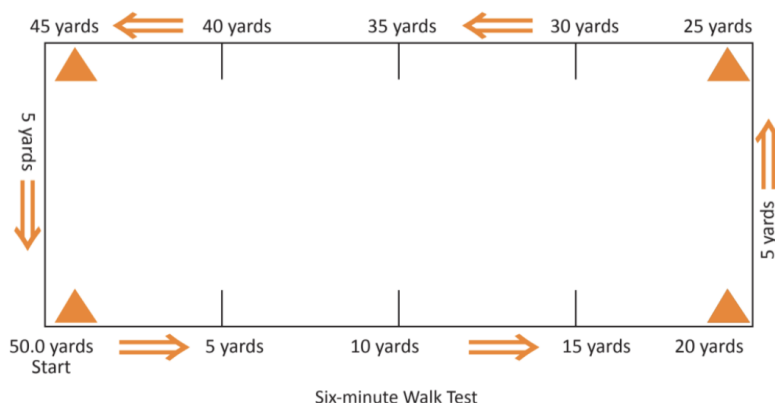
## Unit 6 | Test & Measurements in Sports

### 6 min Walk Test

**Purpose:** This test helps to assess the aerobic fitness or aerobic endurance of a person which is an essential component for walking distances, stair climbing, shopping, sightseeing, etc.

**Equipment Required:** A measuring tape, a stopwatch.

**Procedure:** The walking distance or course is marked i.e., 45.72 m or 50 yards in a rectangular area (20 × 5 yards) of 5 yards with cones placed at regular intervals to indicate the distance covered. Efforts are made to walk maximum distance as quickly as possible in six minutes. A practice trial is given to the participant. He may stop any time if he desires so.



### Johnsen-Methney test of Motor Educability

**Purpose:** The Metheny-Johnson test is actually a test used to evaluate the physical abilities of athletes, & it measures factors such as strength, agility, and speed. It may indirectly assess some aspects of neuromuscular function.

This Test consist of four motor stunts are given below:

1. Front Roll
2. Back Roll
3. Jumping Half-Turns
4. Jumping Full-Turns

**TEST AREA:** Mat area length is 15 feet and it is 2 feet wide  
And the 15 feet length divided into 10 sections.



**Front Roll:** Ignoring the long middle dividing line, the subject is asked to start outside the marked area and perform two front rolls, one upto 7.5' i.e. 3" wide centre line and the other in the second 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.

**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 upto first half and the second back roll in the second half

**Jumping Half Turns:** The subject is asked to start with feet on first 3 inch line, jump with both feet to second 3 inch wide line, executing a half turn. either right or left; jump to third 3 inch 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 inch line or turns the wrong way or both.

**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.



## Unit 7 | Physiology & Injuries in Sports

### Physiology

The study of how our body responds to physical exertion is known as Physiology. When we talk about human physiology, we generally concentrate on the body's skeletal, muscular, nervous, endocrine, cardiovascular, metabolic, respiratory, digestive, urinary and reproductive systems, all of which are influenced by exercise in some way.

### Skeletal muscles factor

#### Type I fibres/Slow Twitch Fibers

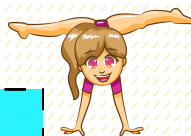
Type I fibres, also known as slow twitch fibres or slow oxidative fibres, have more capillaries, more myoglobin and more mitochondrial enzymes than rapid twitch fibres, which improves aerobic activity and fatigue tolerance. The fibres turn red and there is a bigger flow of blood since there are more capillaries present. These fibres contract slowly and stay constricted for longer periods of time, releasing considerable amounts of energy without tiring. Slow-twitch fibres are beneficial in long-distance sports such as cycling, swimming and running.

#### Type II fibres/Fast Twitch Fibers

Type II fibres, also known as a rapid twitch or fast glycolytic fibres, have a low aerobic capacity and fatigue tolerance due to fewer mitochondria, despite having a high concentration of glycolytic enzymes that promote anaerobic activity. They may produce energy without a blood supply, fast twitch fibres are lighter in colour than slow twitch fibres. Such fibres can generate little amount of energy quickly, contract quickly, tear easily and use a lot of energy. It is useful for anaerobic exercises such as sprinting, throwing and jumping.

#### Endurance

1. Aerobic capacity
2. Lactic acid tolerance
3. Movement economy
4. Muscle composition



#### Strength

1. Size of muscles
2. Body weight
3. Muscle composition
4. Intensity of nervous impulse



#### Flexibility

1. Muscle strength
2. Age and gender
3. Stretchability of muscle
4. Internal environment
5. Previous injury



### Physiological factors determining the components of physical fitness

#### Speed

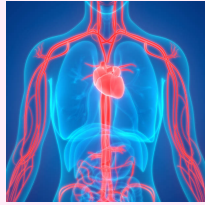
1. Mobility of nervous system
2. Muscle composition
3. Explosive strength
4. Flexibility



## Unit 7 | Physiology & Injuries in Sports

### Effects of Exercises on Cardiorespiratory System

1. Increase the size of heart
2. Decrease in resting heart rate
3. Increases blood flow
4. Decrease in blood pressure
5. Increase in blood volume
6. Decrease in rate of respiration
7. Increase in endurance
8. Increase lungs efficiency



### Effects of Exercises on Muscular System

1. Change in shape and size of muscles
2. Formation of more capillaries
3. Control extra fat
4. Increases food storage
5. Exercise and its health benefits
6. Non functioning fibre become actives
7. Efficiency and movement of muscles
8. Body posture remain correct



### Physiological changes due to Aging

Ageing is characterized by the progressive degeneration of organ systems and tissues. It is largely determined by genetics and influenced by a wide range of environmental factors, such as diet, exercise, exposure to micro-organisms and pollutants.

1. Muscular Strength: It is defined as the maximal force that a muscle or muscle group can generate.
2. Neural Function: A nearly 40% decline in the number of spinal cord axons and a 10% decline in nerve conduction velocity reflects the cumulative effects of ageing on central nervous system functioning.
3. Pulmonary Function: Mechanical constraints on the pulmonary system progress with age to cause deterioration
4. Cardiovascular Function: Cardiovascular function and aerobic capacity do not escape age-related effects.

### Sports Injuries

Sports injuries are caused during sports activities. These can also occur by recent trauma of a certain body location. Athletes' commitment to active participation in sports and fitness has always been disrupted or has resulted in traumatic experiences due to various forms of injuries. Injuries can occur as a result of incorrect movement, hitting or colliding with equipment, violent sporting manoeuvres such as diving and sliding, overtraining, or a lack of conditioning.

### Types of Injuries

#### Soft Tissue Injuries

1. Abrasion
2. Contusion
3. Laceration
4. Incision
5. Sprain
6. Strain

#### Bone Fracture

1. Green-Stick
2. Comminuted
3. Transverse
4. Oblique
5. Impacted

#### Dislocation of Joint

1. Shoulder
2. Wrist
3. Ankle
4. Finger
5. Hip



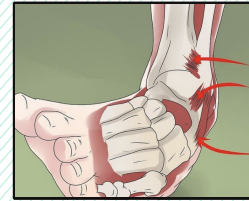
## Unit 7 | Physiology & Injuries in Sports



**Contusion:** Direct head or without any sports equipment can main cause of it. It is due to the minor accident



**Strain:** It can be mild as vessels severe. It can be occur at any time during the practice or competition it is caused by twisting or pulling of muscles



**Sprain:** It is the alignment injury. It may occur due to overstretching or tearing of ligament



**Abrasions** are injuries to the most superficial layers of the skin due to friction.



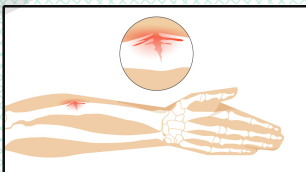
**Laceration:** Deep cuts may reveal underlying tissues such as fat, muscle, bone, or tendons.



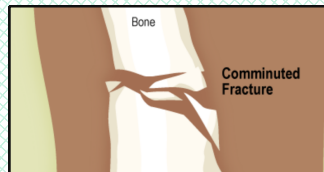
**Incision:** An incision in cut made into the tissues of the body to expose the underlying tissue, bone or organ.

### Soft Tissue Injuries

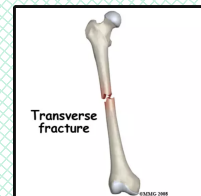
### Types of Fracture Injuries



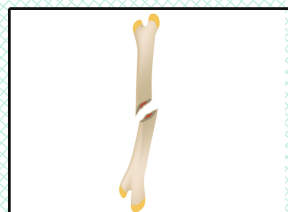
**Greenstick:** A greenstick fracture occurs when a bone fractures and bends rather than totally fracturing into fragments.



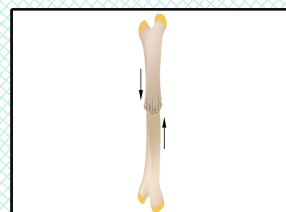
**Comminuted:** A fracture in which a bone is broken, splintered or crushed into a number of pieces is said to be a comminuted fracture.



**Transverse:** This can be found among broken bones. They are parallel to your bone and horizontal (opposite the direction of your bone).



**Oblique:** This fractures can occur in broken bones. They occur when one of your bones is shattered at an angle.



**Impacted:** This occurs when the force of the injury drives the fractured ends of the bone into one another.



## Unit 8 | Biomechanics and Sports

### Biomechanics



Biomechanics is the science of movement of a living body, including how muscles, bones, tendons, and ligaments work together to produce movement.

Biomechanics is the combination of two words- bio and mechanics. Bio means, something pertaining to living beings or life, whereas Mechanics is the branch of physics which studies movement or motion of an object or body with the help of mechanical principles. Thus, when the study of mechanics is limited to living structures and their function, especially the human body, it is called biomechanics.

### Newton's Law of Motion

#### 1st law of Motion

According to Newton's first law of motion, a body at rest will continue to be at rest and a body in motion will continue to be in motion at the same speed and in the same direction unless any external force is applied on it, in order to change its state.

Also called Law of Inertia

Example:

- A moving football first slows down and then stops. It comes to rest due to the friction between the ground and the ball.
- To take a start in sprint races.
- To lift the opponent in wrestling.
- To start hammer throw.

#### 2nd law of Motion

According to this law, the rate of change in acceleration of an object is directly proportional to the force producing it and inversely proportional to its mass.

In case two unequal forces are applied to objects of equal masses, the object on which a greater force is applied will move faster.

Also called Law of Acceleration or momentum.

Example:

- A cricket player while catching a ball moves his hands backwards.
- In baseball, the player hits the ball hard to throw it far away.

#### 3rd law of Motion

According to this law, every action has an equal and opposite reaction.

This implies that forces do not work alone they actually act in equal and opposite pairs between the bodies in contact. This law explains what happens to a body when it applies a force on another body.

Also called Law of Reaction.

Example:

- A cricket player while catching a ball moves his hands backwards.
- In baseball, the player hits the ball hard to throw it far away.

#### First law



Every body remains in a state of rest or uniform motion unless acted upon by a net external force.

#### Second law

$$F=ma$$



The amount of acceleration of a body is proportional to the acting force and inversely proportional to the mass of the body.

#### Third law



For every action there is an equal but opposite reaction. If an object A exerts a force on object B, then object B will exert an equal but opposite force on object A.

## Unit 8 | Biomechanics and Sports

### Equilibrium



Equilibrium can be defined as a state of balance among forces acting within or upon a body. In other words, it is a state in which all influences, forces are cancelled or counterbalanced by each other i.e. the sum of all opposite forces acting on it is zero. Thus, it is a scientific term describing balance and stability.

### Types of Equilibrium

#### Static Equilibrium

It is the balance of the body during its rest or objects that are not accelerating or moving. Static stability mainly depends upon the enlarged base of support, lowered center of gravity, direction of an acting force and body weight.

Stability in sports situations is quite unlike the stability of solid objects.

For e.g., Wrestlers positions, Stance of batsman in cricket, shooting, archery, etc.

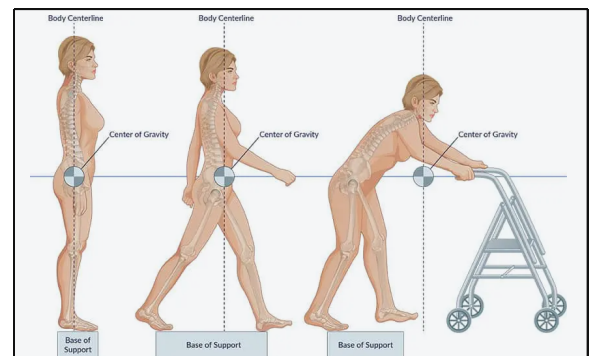
#### Dynamic Equilibrium

It is a balance of body during movement or actions. It frequently happens that the line of gravity of an athlete will fall outside the base of support for a moment.

For example in a sprint start, the body weight is well ahead of the supporting foot, but before the body can fall forward, the other foot moves ahead to provide support and the process repeats itself. Other examples are exercises on balancing beam, low dribble in basketball and all kinds of sports movements.

### Centre of Gravity

It is the "balance point" of the body. The point where the weight of the body acts. The point where all forces acting on the body equal zero. Linear forces must be balanced. Torques must be balanced. Line of Gravity: It is an imaginary vertical line which passes through the center of the body. The location of the line of gravity will depend upon the location of the gravity which changes according to the body's position.



### Application of Centre of Gravity

- (a) The centre of gravity moves according to the athlete's body position. For example, the centre of gravity is lower & in front of athlete's body while he or she is running. Lower body is advantageous for acceleration.
- (b) Low center of gravity also helps to increase stability because it needs to be lifted higher before it moves outside of the base of support. This becomes very useful in combat sports such as sumo wrestling. It is also used by in kabaddi, basketball etc.
- (c) Lowering the centre of gravity increases balance & stability in sports. This is why you can change direction faster by bending your legs and getting lower to the ground. It increases your stability, allowing you to adjust to greater force by the legs.

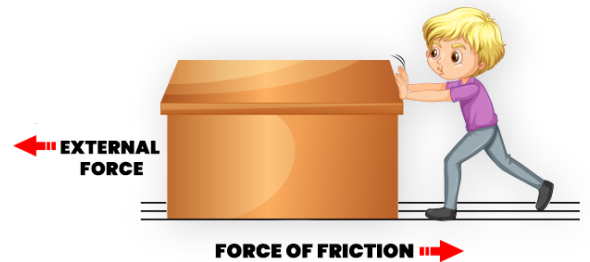


## Unit 8 | Biomechanics and Sports

### Friction

The force acting along two surfaces in contact, which opposes the motion of one body over the other is called the force of friction. It is important in sports. The larger the area of contact between the surfaces, the greater the force of friction. When both the surfaces are smooth, the force of friction reduces almost to zero. Generally, there are two causes of friction:  
 The roughness or irregularities of the surface  
 The strong atomic or molecular force of attraction between the two surfaces at the point of actual contact.

#### FRictional FORCE



#### Types of Friction

##### Static

Static friction is when a force is applied to an object but does not cause it to move. Example: Pushing a wall. Static friction comes into play when a body is forced to move along a surface and movement does not start. The magnitude of static friction remains equal to the applied external forces and direction of motion. The magnitude of static friction depends upon coefficient of static friction and  $N$  (Net normal reaction of the body).

##### Dynamic

##### Sliding

Sliding friction is the divergent force that comes into action as the body slides over the surface of the other body. For instance, ice skating and in pole vault, planting the pole.

##### Rolling

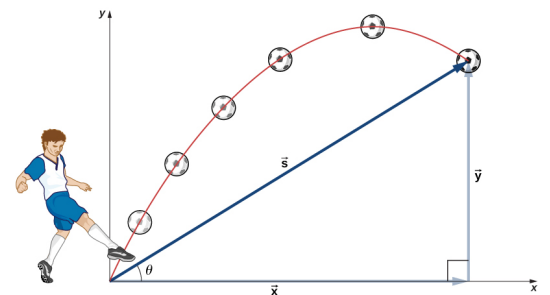
Rolling friction occurs when an object rolls over another (something with wheels or circular like a ball). Example: riding a motorcycle. Rolling frictional force is a force that slows down the motion of a rolling object.

##### Fluid

Fluid friction is defined as the friction that exists between the layers of the fluid when they are moving relative to each other. Example:  
 A person swimming in the water.  
 A plane flying through the air.

### Projectile in Sports

It checks with the motion of an object projected into the air at an angle. An object thrown into the space either horizontally or at oblique angle under the action of gravity is termed as a projectile. Within the field of games and sports, there are many samples of projectiles like putting the shot, throwing a hammer, discus, and javelin in athletics.



### Application of Projectile in Sports

1. Bow and arrow/sling-shot: When an arrow is fired at an angle to the bottom, it follows a parabolic path of a projectile and then it hits the target.
2. In the baseball game, a ball is hit by the bat and then it starts moving in the air but the ball doesn't follow a standardised circular path. The trail is probably going to be parabolic in nature betting on the angle at which it's launched.
3. When a football is kicked then it travels a specific distance within the air & it falls at an angle to the base or ground, this can be an example of projectile motion.
4. When a basketball is thrown into the basket, the ball travels a parabolic trajectory and then goes into the basket.
5. In Gymnastics, plenty of stunts and jumps are performed by gymnasts. The motion of the gymnast as he jumps is parabolic.



## Unit 8 | Biomechanics and Sports

### Types of Levers & their Applications in Sports

Levers in our body are formed from bones, joints & muscles.

A lever consists of the following:

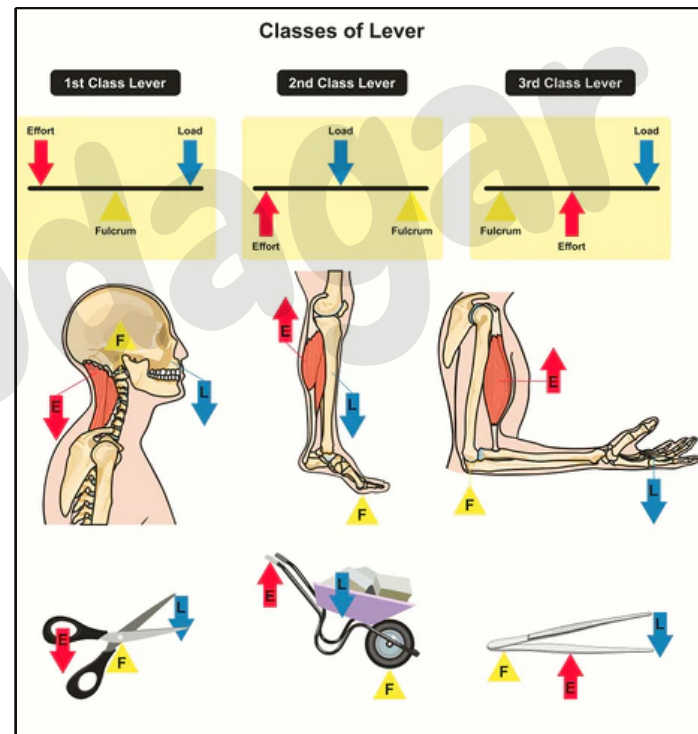
- A rigid structure (bone).
- A force is acting upon it (muscle) to produce a turning movement (angular motion).
- A fulcrum which is a fixed point (joint).
- A load or resistance that is placed on the rigid structure (weight of body part being moved and anything that it is carrying).

There are three types of lever:

**First class lever:** The fulcrum is in the middle of the effort & the load. This type of lever is found in the neck when raising your head to head a football. The neck muscles provide the effort, the neck is the fulcrum & the weight of the head is the load.

**Second class lever:** The load is in the middle between the fulcrum & the effort. This type of lever is found in the ankle area of the foot. When standing on tiptoe, the ball of the foot acts as the fulcrum, the weight of the body acts as the load & The contraction of the "gastrocnemius" muscle is what causes the effort. This second-class lever is used when taking off for a jump or pushing against the blocks in a sprint start.

**Third class lever:** The effort is in the middle between the fulcrum & the load. During a biceps curl, the fulcrum is the elbow joint; the effort comes from the biceps contracting, and the resistance is the weight of the forearm and any weight that it may be holding.



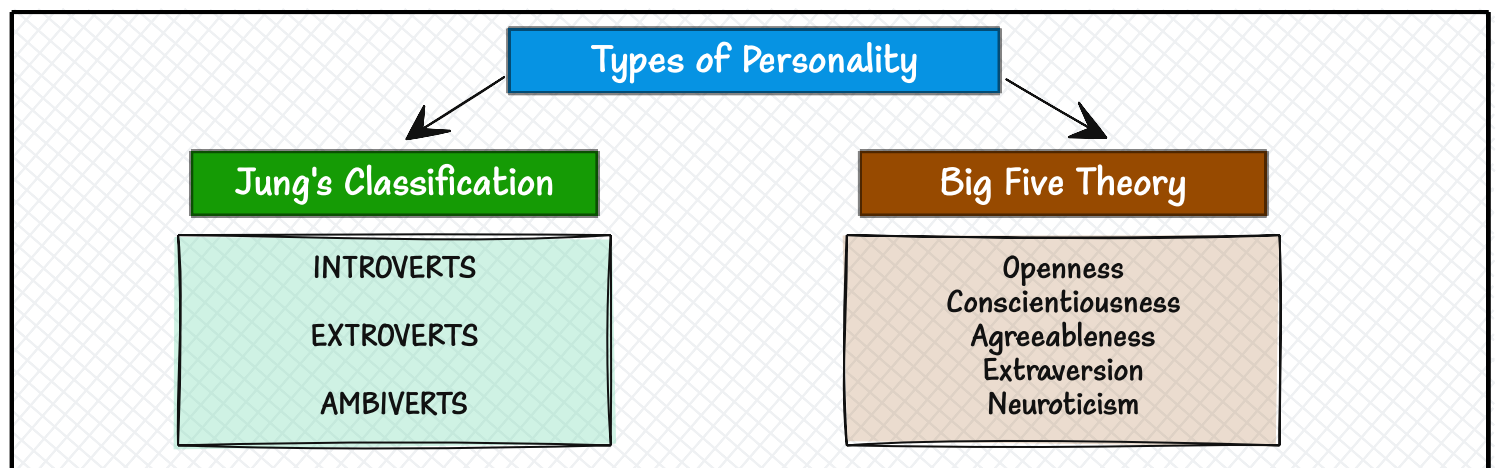
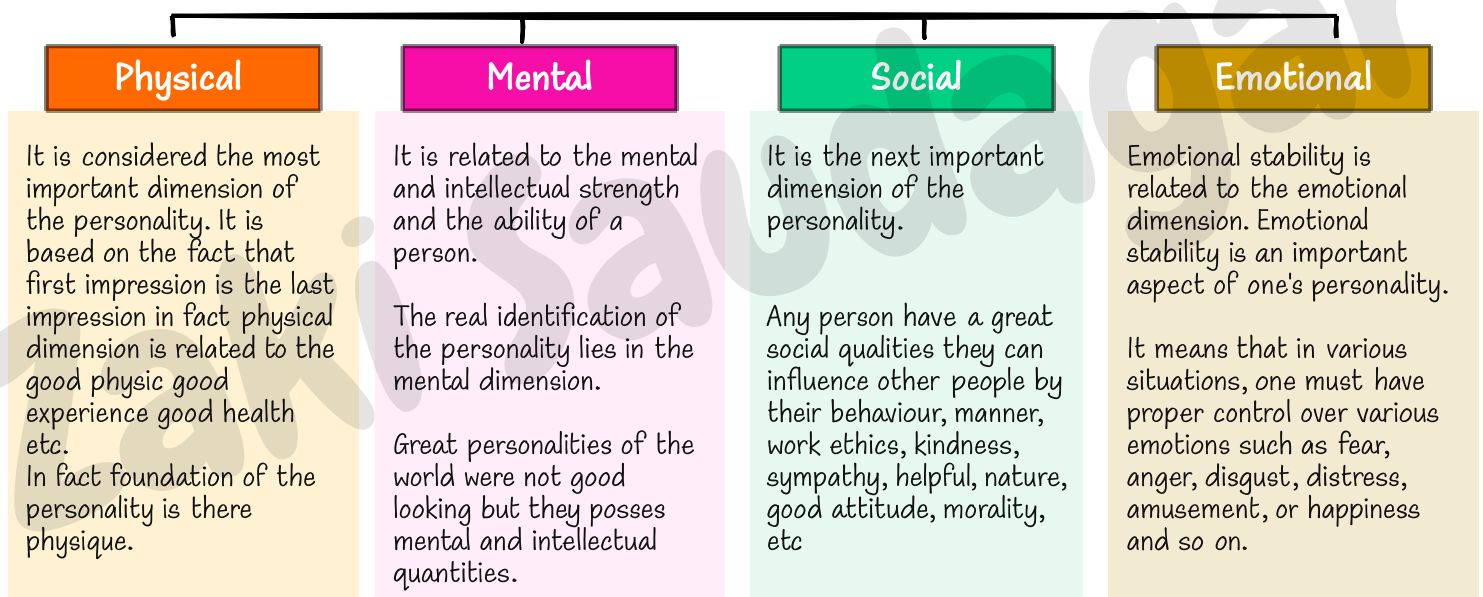
## Unit 9 | Psychology and Sports

### Personality

1. It is the most characteristic integration of an individual's structure, mode of interest, attitudes, behaviour, capacities, ability & aptitudes
2. These definitions do not define personality completely.
3. All the characteristics such as physical mental and social intellectual emotional etc are included in the personality which makes him extraordinary and are expressed from time to time in daily life.
4. It can also be said that the personality is the sum of in inner and outer capacities of an individual

### Dimensions of Personality

Personality is a complete unit in itself but the rate of personality is made up of various dimensions or aspects. The dimension has its own area of operation. These aspects or dimensions together make the personality of an individual.



### Jung's Classification

Carl Jung defines personality types based on mental characteristics. Following are the 3 types of personalities given by Carl Jung:



## Unit 9 | Psychology and Sports

### Introverts

Introverts are overly self-conscious, preoccupied with their own thoughts and ideas, self-centered, shy, reserved and seek solitude. They do not easily make friends and prefer to remain in the background at social gatherings. Philosophers, poets, artists and scientists fall into this category.

### Extroverts

Extroverts have more self-assurance, show more interest in others and are more outgoing, lively and realistic. They are very social and easily make friends.

This category includes actors, social and team leaders and others.

### Ambiverts

Ambiverts are a balanced mix of both introverts and extroverts.

Ambiverts are neither outgoing or reserved.

They are adaptable. People who don't belong to any of the above two categories, belong to this category.

## Big Five Theory

### Openness

People who enjoy learning new things, new concepts and new experiences tend to be the most open. It includes characteristics such as being imaginative, insightful & having a wide range of interests.

### Neuroticism

This trait is concerned with one's emotional stability and the extent to which negative emotions are expressed. Individuals with high neuroticism are prone to emotional instability & negative emotions. These people remain moody and tensed.

### Extraversion

Excitability, sociability, talkativeness, assertiveness and a high level of emotional expressiveness characterize it.

Extroverts have high extraversion, while introverts have low extraversion.

### Conscientiousness

Its characteristics include thoughtfulness, impulse control and goal-directed behavior.

People who score high on this trait are well-organized and detail-oriented.

### Agreeableness

It includes characteristics such as trust, kindness, affection and other social behaviors.

People who score high on agreeableness are more cooperative, while those who score low on this trait are more competitive and manipulative.

## Motivation

Motivation is the driving force behind our actions and behaviors. It is what propels us to pursue our goals and aspirations, even in the face of obstacles and setbacks. Motivation can come from a variety of sources, such as personal values, external rewards, or a desire for personal growth and development.

### Intrinsic Motivation

It refers to the drive that comes from within an individual to pursue a task or activity for his/her own sake, rather than for external rewards or incentives. This type of motivation is often associated with feelings of enjoyment, interest and personal fulfillment. Research has shown that individuals who are intrinsically motivated are more likely to persist in their efforts, experience greater satisfaction and achieve higher levels of performance. Intrinsic motivation can be fostered by providing opportunities for autonomy, mastery and purpose in one's work or activities.

### Extrinsic Motivation

It refers to the drive to perform a task or behavior in order to receive external rewards or avoid punishment. This type of motivation can be effective in the short-term, but may not lead to sustained engagement or satisfaction with the task at hand. Examples of extrinsic motivators include money, grades and praise from others. It is important to note that while extrinsic motivation can be helpful in certain situations, fostering intrinsic motivation, the drive to engage in a task for its own inherent enjoyment or satisfaction, may lead to more long-term engagement and fulfillment.

### Technique of Motivation

1. Developing an Innovative Curriculum
2. Understanding your Athlete
3. Incentives & Rewards
4. Assigning Specific Roles
5. Valuable Feedback System
6. Determining Incentive Factors

## Unit 9 | Psychology and Sports

### Aggression

Aggression is a behavior that is intended to cause harm or pain to another person. It is often characterized by hostile or violent words or actions and is a common problem in many societies. Aggression can take many forms, including physical, verbal and psychological.

#### Instrumental

The primary goal of instrumental aggression is to achieve a goal through aggression. It's a good kind of aggression. The player's goal in this situation is to excel in the sport he is playing through high intensity output and a competitive spirit. Experienced players exhibit instrumental aggression on the field because they have more self-control in managing their aggression.

#### Hostile

The primary goal of hostile aggression is to harm or injure your opponent. It is typically an unplanned, impulsive reaction to a player who has become a threat to the goal's achievement. It could also be planned to injure the intended player on the field.

This type of aggression is frequently motivated by insult, hurt, bad feelings, jealousy and threat.

#### Assertive

Assertive behavior is all about standing up for yourself, but aggression usually involves threatening, attacking, or (to a lesser degree) ignoring others.

Assertive individuals stand up for themselves—for their beliefs, their values, their needs. And they do so in a respectful, unthreatening, nonviolent way.

### Exercise Adherence

Exercise adherence is the degree to which an individual follows his/her exercise program. Adherence to exercise is critical to achieving health benefits. Research shows that adherence to exercise can be improved by setting realistic goals, providing social support and offering positive feedback.

#### Reasons to Exercise

1. Lower Risk of Disease
2. Overcoming Social Physique Anxiety
3. Mental Relaxation
4. Socialisation
5. Recreation
6. Healthy Body Means Healthy Mind

#### Benefits to Exercise

1. Weight Management
2. Promotes Self-efficacy
3. Strong Immune System
4. Strengthens Bones & Muscles
5. Provides Stress Relief
6. Improves Value Orientation
7. Develops Leadership Qualities
8. Personality Enhancement

### Psychological attributes in Sports

Psychological attributes in sports are the mental characteristics of athletes that can affect their performance in a sporting event. These attributes include things such as motivation, focus, confidence, resilience and the ability to manage stress.

#### Self Esteem

Self-esteem is an important factor in sports, as it can have a significant impact on an athlete's performance. In sports, self-esteem can have an effect on an athlete's level of motivation, confidence and overall performance.

#### Self Talk

Self talk is the internal dialogue that athletes have with themselves, which can be either positive or negative. Positive self talk can help athletes focus on their goals and stay motivated, while negative self talk can lead to feelings of doubt and decreased performance.

#### Mental Imagery

Mental imagery involves creating vivid mental pictures of success, which can help athletes visualize their goals and stay focused on their performance. It helps athletes perform successfully and feel satisfied with their performance.

#### Goal setting

Goal setting is the process of setting specific, measurable and achievable goals that can help athletes stay on track and measure their progress.



## Unit 10 | Training in Sports

### Sports Training

Training means the process of preparation for some task. Sports training is a special process of preparation of sports persons based on scientific principles aimed at improving and maintaining higher performance capacity in different sports activities. It is a particular type of training designed to improve fitness and abilities to perform in a given sports

### Talent Identification

1. Talent Identification is to ensure that the appropriate players are being selected.
2. Selection must be done fairly and equitably. This requires a better understanding of player identification and the adoption of a suitable selection policy.
3. Selectors need to ensure that they are assessing the correct qualities and attributes, and to ensure consistency in selection.
4. Talent identification is the process of recognising current players that have the potential to excel. It involves an attempt to predict the future capacity of performance of an individual.
5. Talent identification is based around a number of areas, these being physical attributes, physiological skills, technical skills, psychological skills, cognitive skills and social skills
6. It is important that the talent identification programme has a clear focus that places the emphasis on identifying players with long-term potential rather than current, tournament winning ability.

### Sports Training Cycle

1. There is a concept of periodisation in sports which includes three different training cycles.
2. Periodisation is an organised approach to training which involves progressive cycling of various aspects of a training programme during a specific period of time.
3. It can be defined as the purposeful variation of a training programme over time, so that the competitor gets closer his or her optimum adaptive potential just before an important event.

#### Macrocycles

A macrocycle refers to the entire season or training period as a whole. For an athlete, if the competitive season happens once a year, then the macrocycle will be of a full year. If there will be two competitions within a year, then we say there are two macrocycles. Macrocycles are then further divided into mesocycles.

#### Mesocycles

The meso cycle represents a specific block of training that is typically made up of 3-4 micro cycles (3-4 weeks) that is designed to accomplish a particular goal. A mesocycle form a number of continuous weeks (micro cycles) where the training programme focuses towards improving the same physical adaptations, for example maximal strength, static strength, maximal speed or Functional Threshold Power (FTP).

#### Microcycles

Within mesocycle, we have micro- cycles. These are the least unit or block of time within a mesocycle and are normally a week long though it can vary from a few days to a few weeks.

### Strength

1. It is the capacity of the whole body d or off any of its path to exert force.
2. Muscular strength is the force that a muscles or a group of muscles can exert against a resistance in one maximum effort
3. It is defined as the amount of force a muscle or group of muscle can exert

#### Types of Strength

##### Static

##### Dynamic

Maximum, Explosive, Strength Endurance

## Unit 10 | Training in Sports

### Static Strength

Static strength is also known as Isometric Strength. It is the ability of muscles to contract against resistance. Static strength can be measured using a Dynamometer. This kind of power cannot be seen directly. Static strength is rarely used in sports, but it is generally used in phases during weightlifting.

### Dynamic Strength

Dynamic strength is also known as 'Isotonic Strength', because it is related to the movement. We require dynamic strength to complete pullups and push-ups. Muscles begin to refuse to work after a certain time period due to the tendency of dynamic strength to decline during such workouts. Ex: Push-up & Pull-Up

### Types of D.S.

- i) Maximum Strength: It is the ability to work against maximum resistance. Ex- Weightlifting, Shot Put etc.
- ii) Explosive Strength: It is the ability to overcome resistance with high speed. It is the combination of strength & speed abilities.
- iii) Strength Endurance: It is the combination of strength & endurance abilities. Commonly for long distance races, swimming, cycling etc.

### Method of Improving Strength

#### Isometric Exercises

This exercises are those exercises, which are not visible. In fact there are no direct movements, hence they can't be Observed. In these exercises, work is performed but is not seen directly. In these exercises, a group of muscles carry out tension against the other group of muscles. For example, pushing up against a strong wall.

#### Isotonic Exercises

While doing exercises tension creates in working muscles and there is a change in length. Muscles get shortened and lengthened.

Isotonic exercises tone up the muscle. Muscles become flexible. Activities like Jumping, running, Weight lifting are some examples of isotonic exercises.

#### Isokinetic Exercises

In these exercises, there is a movement with continuous tension in both flexor and extensor muscles. In this muscles contract throughout the range of movement at a constant speed. Both flexor and extensor muscles contract simultaneously, as a result, both develop, thus it takes less time to build muscle. Activities such as rowing and swimming,

### Endurance

1. Endurance is the ability to sustain or continue the activity.
2. In other words, it is the ability to resist fatigue for a longer period.
3. Endurance is required for almost all major sports. It is one of the important components for middle and long-distance races, football, hockey, basketball, handball, etc.

### Types of Endurance

#### Speed Endurance

This is the type of endurance in which the activity is done with high speed and intensity. This endurance is for a shorter duration (from 30 to 60 sec) with 80% to 90% of top speed ability. This type of Endurance is required in medium distance races, swimming, basketball, tennis, badminton, etc.

#### Strength Endurance

This type of activity is done powerfully and forcefully for a shorter duration. This duration is from 2 to 3 minutes.

Strength endurance is generally performed in absence of oxygen. It is required in wrestling, boxing, Judo, etc.

#### Long term Endurance

This type of Endurance is required when the activity is done for a longer duration and the intensity or speed is slow. It delays fatigue, it is required for long-distance running, cycling, cross country, marathon, football, etc.



## Unit 10 | Training in Sports

### Method to Improve Endurance

#### Continuous Training Method

It is one of the best methods for improving endurance. In this method, Athletes perform running for long periods without taking rest in between.

In this method, speed remains slow because the exercise is done for a longer period. This method develops a very high level of Endurance.

This method has three types:

1. **Slow Continuous Training Method:** This method is used by long-distance runners. Duration of workout is 1 - 2 hours, distance covered is 10 - 20 km.

2. **Fast Continuous Training Method:** This method is used by middle-distance runners. Duration of workout is 15 - 40 minutes, distance covered is 5-10 km

3. **Variable Continuous Training Method:** This method is a combination of fast and slow pace continuous methods. Here the workout is done with a variable speed of 40-100 percent of the best capacity.

#### Interval Training Method

In this method, the principle of effort and incomplete recovery is followed. It is special endurance training that involves high-intensity workouts followed by incomplete rest. This method is the best method for endurance development. The Interval training method is based upon the scientific principles where the load is controlled through various factors to provide incomplete recovery.

Workout - Rest - Workout - Rest...

#### Fartlek Training Method

The only thing to keep in mind, that he needs to reach the finishing point in the desired time.

Advantages of Fartlek Training Method

1. It can practice in off season period
2. It develops creativity and gives adventure
3. Natural motivation is there with no boredom
4. Art of self-learning is experienced

### Speed

1. Speed is the ability to perform the movement at a faster rate. Speed depends on heredity but can be developed through proper training.
2. It is the capacity of moving a body with the greatest possible velocity.

#### Types of Speed

- **Reaction Time:** It is the time taken by the body to respond immediately after the stimulus. It is the first reaction to bring our body into action.
- **Acceleration Ability:** It is the time taken by the body to reach maximum speed. This ability depends upon explosive strength, technique, and flexibility.
- **Speed of Movement:** It is the time taken by the body to perform complete action.
- **Locomotor ability:** It is the ability to maintain maximum speed for maximum distance.
- **Speed endurance:** It is the ability to perform movements with high speed under conditions of fatigue.

#### Method to Improve Speed

1. **Acceleration Run :** In this method, Athletes try to attain top speed as fast as possible. They run for 20 - 30 meter distance with maximum speed. This is repeated 5 to 10 times with a sufficient rest period. The first few strides should be shorter and the frequencies of steps are very fast.

2. **Pace Run Training Method :** Pace races mean running the whole distance of a race at a constant speed. For 800m training athletes can run a distance of 300m or 20% of racing distance at full speed.

### Flexibility

1. Flexibility is when the joints can move to their maximum range. It is the ability to execute movement with greater range.
2. It is affected by muscle length, adjoin ligaments, tendons. Flexibility helps in preventing injuries, Improving Posture, making the joint healthy, Improving balance.

## Unit 10 | Training in Sports

### Types of Flexibility

**Passive Flexibility:** Joints can move in maximum range with external help, e.g. stretching with a partner.

**Active Flexibility:** It is performed without external help. Active flexibility is further divided into two parts:

➡ **Static Flexibility:** It is the flexibility performed from a stationary position. e.g. Chakrasana, toe touching

➡ **Dynamic Flexibility:** It is the flexibility performed while in motion. This is required for gymnastics, diving, etc.

### Coordinative Ability

1. Coordinative Ability is the ability of the body to perform the movement with perfection and efficiency. It is the ability to execute a sequence of movements smoothly and accurately.
2. Coordination is required for qualitative movement. It is the proper combination of strength, speed, endurance, and flexibility during movement

### Types of Coordinative Ability

🏹 **Adaptive Ability:** Ability to adjust the movement effectively based on changes.

🎯 **Balance Ability:** Ability to protect the body in a stable position

🎵 **Rhythm Ability:** Ability to observe the rhythm of a movement and to regain balance quickly.

👉 **Reaction Ability:** Ability to react immediately and quickly to a signal.

👉 **Coupling Ability:** Ability to combine the movements of different body parts for performing a perfect sports movement.

### Circuit Training

Circuit training is a type of resistance training or body conditioning that involves high-intensity aerobics. It aims to increase physical endurance and strength. In this training technique, specific exercises of varying kinds are carried out with or without equipment at a prescribed dosage.

An exercise "circuit" is a set of all the program's prescribed exercises. Following the completion of one circuit, the first exercise is repeated for the following circuit. It was developed in 1957 by "Adamson and Morgon."

### Method to Improve Flexibility

1. Ballistic Method: In this method, individuals perform various stretching exercises while in motion. In this stretching the muscle with help of swinging the limbs.
2. Static Stretching Method: In this method, various slow stretching exercises are done from a stationary position and hold the final position for sometimes.
3. Passive Flexibility Method: In this method flexibility exercises are done with external help. Such as partner help, stretch ropes, bid role ball, bar stand, etc.
4. Proprioceptive Neuromuscular Facilitation Techniques (PNF): This technique is used by advanced athletes for gaining flexibility. Here you move into a stretch position then your partner holds the limb in this position.

### Method to Improve C.A.

1. Target Exercises: Target practice is an important exercise for improving hand-eye coordination. Despite appearances, aiming and throwing something at a target is a very complex and difficult task.
2. Balance Exercises: This exercises must be included in your coordination training. Because of your ability to perform static movements, you can perform a variety of bodily functions such as walking, squatting and pressing overhead.
3. Ball or Balloon Toss: Catch the balloon and bounce it back and forth with your hands, head and other body parts. Because the balloon floats slowly, you can change the angles to make the exercise more unpredictable. When working out with a partner, or a trainer, try standing farther apart or facing different directions.

### Benefits of Circuit Training

1. It is a simple and engaging technique.
2. It only takes a brief time.
3. It can be done both inside and outside.
4. It impacts all of the body's organs.
5. The coach can readily keep an eye on it.
6. It creates a captivating environment.

### Importance of C.A.

1. It increases stamina and strength. A single circuit can result in maximum muscular function.
2. It relieves all forms of strain.
3. It is an exercise programme that combines resistance training with cardiovascular fitness.