



Health & Physical Education

Activity Book

Standard X



Government of Kerala
Department of Education

Prepared by
State Council of Educational Research and Training (SCERT) Kerala
2016

The National Anthem

Jana-gana-mana adhinayaka, jaya he
Bharatha-bhagya-vidhata.
Punjab-Sindh-Gujarat-Maratha
Dravida-Utkala-Banga
Vindhya-Himachala-Yamuna-Ganga
Uchchala-Jaladhi-taranga
Tava subha name jage,
Tava subha asisa mage,
Gahe tava jaya gatha.
Jana-gana-mangala-dayaka jaya he
Bharatha-bhagya-vidhata.
Jaya he, jaya he, jaya he,
Jaya jaya jaya, jaya he!

Pledge

India is my country. All Indians are my brothers and sisters.

I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

State Council of Educational Research and Training (SCERT)

Poojappura, Thiruvananthapuram 695012, Kerala

Website : www.scertkerala.gov.in

e-mail : scertkerala@gmail.com

Phone : 0471 - 2341883, Fax : 0471 - 2341869

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Dear students

Physically and mentally strong people are a valuable asset to any nation. Like languages, arts and sciences, mental and physical health is also essential for the development and progress of individuals as well as the society. It is for the same reason that Health and Physical Education is given special consideration in today's educational scenario. Sports and games not only stimulate the mind and the body but also train people to interact with one another to work as a team and also to maintain both personal and environmental hygiene. It is a very decisive as well as supportive component in national development.

It is our sincere wish that all of you should become physically and mentally strong by observing personal and ecological hygiene. The instructions and activities included in this textbook will surely help you attain this. I hope you will assimilate the contents in this book in its true essence and spirit with the help of your teacher.

Best wishes

Dr. P.A.Fathima

Director
SCERT, Kerala

Text book Development Team

Abdul Jalal.T, Sports Demonstrator,
Thiruvananthapuram

Ajikumar.T, Lecturer, DIET, Kottayam

Ajith Varghese, GHSS, Ramadhali, Kannur

C.Anilkumar, MVPV HSS, Peroor

Dr. Ajeesh.P.T, Govt. GV Raja Sports School,
Mylam, Thiruvananthapuram

Dr. Pradeep.C.S, Principal, Govt. GV Raja
Sports School, Mylam, Thiruvananthapuram

Hareesh Sankar, GHSS, Thattathumala,
Thiruvananthapuram

Jose John, GHSS, Poothrika, Ernakulam

Lijin.R.S, GVHSS, Vakkom

Midin.A.S, GHSS, Kattoor

Muneer.M, DUHSS, Thootha

Sajeesh.K.C, GGHSS, Cheruthazham, Kannur

Sandheep.P.P, GHSS, Corome, Kannur

Shihabudheen.S, GHSS, Azhoor

Siju P. John, St. Francis HSS, Mattom

Sunil Ramachandran, GHSS, Pazhayannur

Vijayababu.K.G, Lecturer, DIET, Kollam

Experts

Dr. Ajithmohan

Asst. Director, Cusat

Dr. Kunhikannan.R

HOD & Asst. Professor, Govt. College,
Kulathoor, Neyyattinkara

Dr. Manoj.T.I

Deputy Director, Vidhyarthikaryam, Kerala
Agricultural University

Dr. P.T.Joseph

Director of Physical Education, Kannur
University, Kannur

Dr. Praveen Kumar.T.K

Asst. Professor, Govt: Medical College,
Thiruvananthapuram

Dr. Suresh Kutty.K

Associate Professor, Kannur University

Aji.P.L

Asst. Professor, Govt: Sanskrit College,
Thiruvananthapuram

Jairaj.J

HOD & Asst. Professor, Govt. Medical College,
Alappuzha

Sunil Alphons

Asst. Professor, Govt. College of Engineering,
Kannur

Syamnath.K

Asst. Professor, Govt. College of Engineering,
Kannur

English Version

Dr. Lalitha.M

Retd. Librarian, SCERT

Deape.N

Asst. Professor of English, Govt: Arts College,
Thiruvananthapuram

Jose D.Sujeev

GHSS, Neduveli, Thiruvananthapuram

Manju.C.R

Asst. Professor of English, Govt: Arts College,
Thiruvananthapuram

Marry Suneetha Joy (FDP)

University College, Thiruvananthapuram

Nisha.N

Asst. Professor of English, University College,
Thiruvananthapuram

Rajalekshmi Syamala

GHSS Venganoor, Thiruvananthapuram

Soumya.S

Asst. Professor of English, University College,
Thiruvananthapuram

Artists

Madhusoodanan.U.V

GVHSS, Madai, Kannur

Shiju.P

Chadayamangalam (Freelance)

Academic Co-ordinator

Jancy Rani.A.K, Research Officer, SCERT



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1

Beauty Through Health

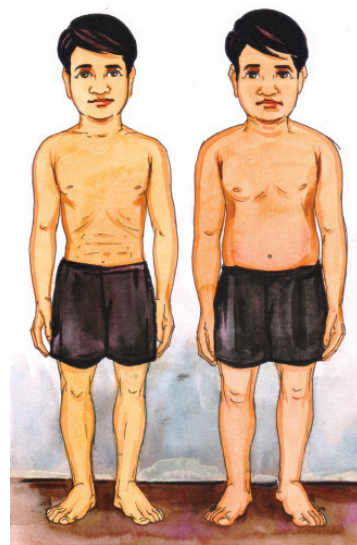
Learning Outcome

- Recognizes that true beauty is not just external appearance, but also health hygiene and physical fitness.

It is a shame for a man to grow old without seeing the beauty and strength of which his body is capable". - Socrates

Vipin and Lipin are identical twins. During childhood, only their parents and close relatives could distinguish them. Vipin is hardworking, health conscious, hygienic and also had a good reading habit. He is dear to all.

On the other hand, Lipin is lazy, careless about his health and hygiene. Obesity and frequent illness used to trouble him. When his friends started sympathizing with him, he wished to be like Vipin.



Activity 1

You have read the descriptions of Vipin and Lipin, haven't you? Why did Vipin's classmates wish to be friendly with him? What should Lipin do to be like Vipin?

1. Vipin is very attractive
2.
3.
4.
5.

Beauty of an individual or a thing is the sum total of all the abilities.

Adolescence is the period in which greatest importance is given to beauty. 'Beauty lies in the eyes of the beholder' goes the famous saying. One thing is certain, there is beauty in everyone. How a person manifests beauty is more important. Let's see how the following factors affect beauty.

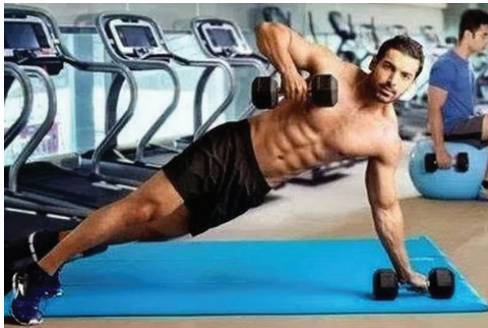
- a. Body shape
- b. Body posture
- c. Hygiene
- d. Proper nutrition

a) Body Shape

Beauty lies in Proportions – Pythagoras

This theory of Pythagoras is the basis of physical beauty. The ability to attain muscle mass which one is capable of without a change in the natural body proportion lends physical beauty to a person.

Regular exercise helps to maintain the body shape. The shape of the body is



adversely affected by the fat that accumulates in the abdominal region. The abdominal region is the area that is first affected due to lack of exercise and it is the same region that takes the longest time to get into shape. This limitation can be overcome by strengthening the abdominal muscles.

Follow the instructions of the teacher, do the activities given below after a game of 15 minutes' duration.

Activity 2

i) Abdominal Crunches

Lie flat on your back. Bend your knees and hold them close to your body as shown in the figure. Hold your hands against the chest and gently lift only the upper body in such a way that the abdominal muscles are compressed. Then come back to the normal position.



Fig. 1.1

Activity 3

ii) Reverse Crunch

Lie flat on your back. Bend your knees as shown in the figure and hold them close to the chest. Continue till your back raises a little bit from the floor. Revert to your starting position.

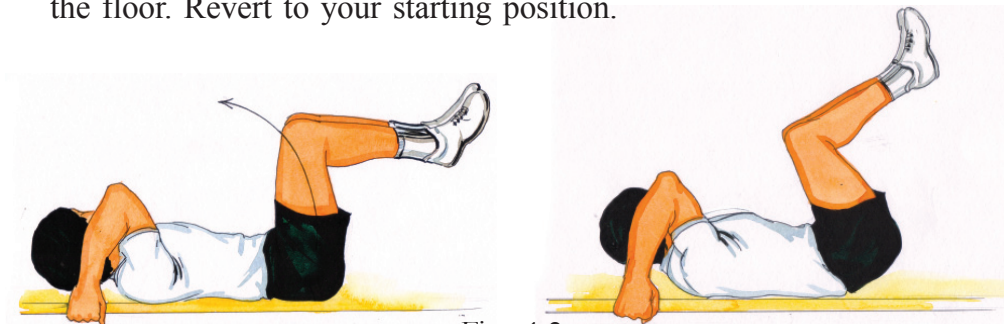


Fig. 1.2

Activity 4

i) Double Crunch

This is a slightly more difficult exercise. Abdominal crunch and reverse crunch are done together at the same time as shown in the figure.

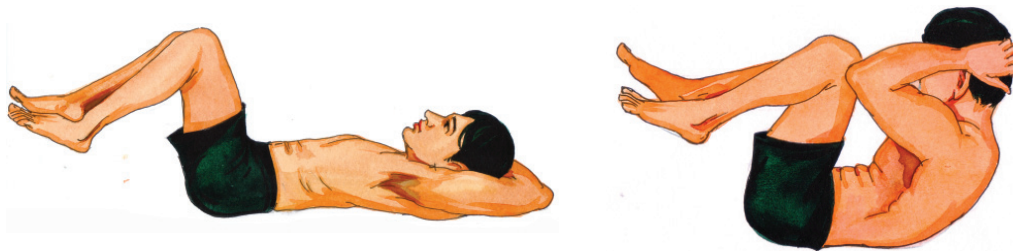


Fig. 1.3

Activity 5

ii) Side leg lift

Lie slanting to one side. Stretch one leg and lift it upwards. Bring it back to the initial position. Repeat the same on the other side.

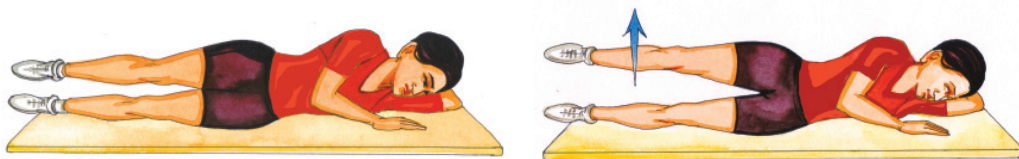


Fig. 1.4

Activity 6

iii) Reverse side lift

Lie slanting to one side. Bend the knees and lift the top portion of your body. You can support yourself by placing one hand on the floor as shown in the figure.

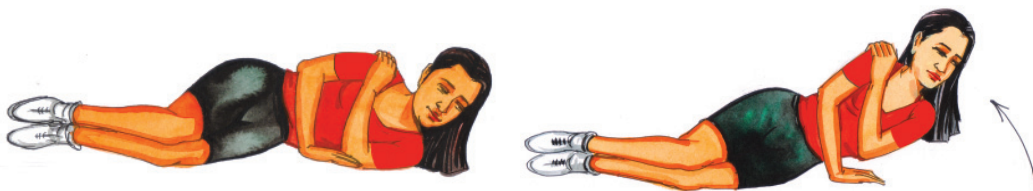


Fig. 1.5

Activity 7

vi) Back leg lift

Lie flat on your stomach. Lift each leg one after the other as shown in the picture.



Fig. 1.6

b) Body Posture

A Perfect body posture is a mark of beauty. The fundamentals of a good body posture – sit tall, stand tall and walk tall-leads to beauty. Proper functioning of the sense organs helps to maintain body posture. We must therefore ensure that good care is taken to protect the sense organs.

c) Hygiene

Hygiene is a basic pre-requisite for beauty. All attempts to enhance beauty leads to proper hygiene.

Feet, toes, fingers, place in between the nails, private parts of the body etc, should be kept clean always. Beauty enhancement techniques such as pedicure, manicure etc. aim at these. In addition to removing the dirt, these treatments remove the dead and damaged cells on the skin. After bath, it is essential to dry the body and remove the dampness. The towels should be properly dried in the sun.

Eyes, teeth, skin, ears and nose should be kept clean and healthy. Vision problems should be avoided as far as possible.

Active participation in physical activities helps in flushing out the waste products from our body. If you sweat after a physical activity or by some other means, take bath immediatly after the sweat has dried out. This prevents bad body odour.

Protection of eyes

- a. Avoid long hours on the computers or mobile phones.
- b. Avoid reading, watching TV, etc. in dark rooms and while travelling.
- c. While reading for long hours, take short breaks and focus on faraway objects or green coloured objects.
- d. While washing the face, sprinkle water in your eyes.
- e. Exercise for the eyes should be done regularly.
- f. Ensure sound and requisite sleep.



Wearing neat and clean clothes in a proper manner is a mark of beauty. Dressing which irritates others creates hindrance to beauty.

Teeth

1. Brush your teeth twice daily.
2. Clean your mouth after having snack or sweets
3. Wash the inner portion of the mouth and jaw after brushing the teeth.
4. Do not brush your teeth too hard.
5. Do not use the same tooth brush for a long period. If possible, use a tooth brush with soft bristles.



d) Proper Nutrition

Proper nutrition is another pre-requisite for good health. It provides a healthy physique. Drinking water at frequent intervals helps to keep the skin radiant. The food contents which increase the blood volume, such as Vitamin E, iron-rich food and water, must be included in the daily diet to enhance the beauty of the skin.

The skin gets oxidised due to the exposure to sun and in other ways. This leads to wrinkles and deterioration on the skin. Intake of food rich with antioxidants will help resist these and increases one's beauty.

Moreover, other factors like better mental and social status influence beauty. A pleasant and smiling face is always more attractive than a dull and gloomy face.

Social status nourishes your body language and leads to perfect beauty. Ability to speak well and the ability to interact with self confidence enhance the beauty of an individual.

Good and proper rest is as important for the body as exercise. It is during sleep that regeneration of tissues, improvement of immunity as well as growth and development take place. The REM (Rapid Eye Movement) stage during deep sleep is the indication of actual rest. It is at this stage that knowledge consolidation and memory enhancement takes place. A good sleep also restricts the production of **ghrelin**, the hormone that stimulates hunger and thus prevents obesity. The following tables indicate the minimum amount of sleep required for different age groups.

Age	Sleep
Birth - 2 months	12 - 18 hours
3 months - 1 year	14 - 15 hours
1 year - 3 years	12 - 14 hours
3 years - 5 years	11 - 13 hours
5 years - 12 years	10 - 11 hours
12 years - 18 years	8 ½ - 10 hours
18 years onwards	7 ½ - 9 hours

Table 1.1

To conclude this unit, the health factors such as better physical, mental, social and emotional conditions lead to perfect beauty. Hence, by taking good care of our health and by maintaining a good life style, one can achieve beauty.

Activity 8

Discuss and prepare a note on the factors, which according to you, form the basis of beauty, other than those mentioned earlier.

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Driving two wheelers for long hours will damage the eyes and the skin of a person. Hence, it is necessary to take precautionary measures such as wearing helmet, sunglasses, overcoat, etc.

Assessment



Look at the picture of Leander Paes who plays with determination and grit in his forties? A healthy lifestyle has given him a body shape and beauty beyond his age. Prepare a write up on the beauty of a celebrity who leads a similar life.

2

Games in Daily life

Learning Outcomes

- Identifies that physical activities help in reducing physical and mental stress.
- Enriches physical and mental power by engaging in various yoga practices.
- Recognizes the different activities that improve physical fitness.

Stress among children

Stress often adversely affects the equilibrium of the body at the physical, mental and emotional levels. It increases anxiety in the and often leads to complications dangers.



Participating in games or even enjoying them helps for the relief of both mental and physical stress. In addition to sports, mental exercises that improve concentration and to ease stress in an individual.

Activity 1

Simple Meditation

Simple meditation is an activity that can be practised by children from the primary level to the higher secondary level to gain relief from stress. Such activities are very effective and important. Meditation helps to bring about physical and mental development and inculcate a healthy culture in children. It is a state in which the mind is relaxed and calm, free from all worries. Man has been practising meditation since time immemorial.



Fig. 2.1

Instructions

1. Check your pulse and record it **My pulse is**
2. Sit in a convenient posture, keeping your spine straight. Let your mind and body be calm. Now, do relax belly breathing/abdomen breathing 10 times.
3. Practise deep breathing in groups (5-10 times).
4. Move your head slowly from one side to the other (5-10 times).
5. Bend your head forward slowly and try to touch your chest with the chin. Now, move the head slowly upward and then backward.
6. Drop the arms to either side of your body. Now, gently shake the arms.
7. Lift your feet slightly off the ground and shake both your legs.
8. Close your eyes slowly when instructed. Do not think about anything. Keep the mind calm. Sit in this position for two minutes. Then open your eyes slowly.



Fig. 2.2

*Relax belly breathing/abdominal breathing – The method of expanding the abdomen as you inhale and contracting as you exhale is known as relax belly breathing.

9. Keep your spine straight and sit comfortably in a balanced position. Close your eyes slowly and sit for 2 minutes. Then slowly open your eyes.
10. Check your pulse rate once again. Compare it with the pulse rate taken earlier before the meditation. Share your experiences with your teacher.

Things to Remember

Meditation should be made a habit to reduce mental stress and gain good mental health. Meditation can be done in school or at home according to one's convenience and availability of time.

Activity 2

My experience

Narrate your experience after simple meditation.

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Activity 3

Visual imagery



Fig. 2.3

Visual imagery activities help in reducing mental stress.

Instructions

- Sit in a convenient/suitable position as per the instructions of your teacher. You can also do these activities while lying down.
- Follow all the instructions for doing the activity.





For example: Select and visualise suitable situations such as going to the seashore, engaging in different games, commentary of world cup matches and so on.

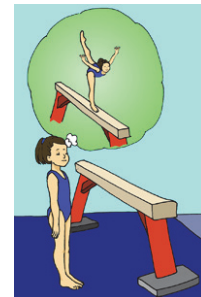


- Listen to each instruction and follow it.

- Follow all the instructions provided by your teacher from the beginning to the end. Don't let any other thought trouble your mind in between the activity while visualising.



- After each instruction, a fixed interval of time will be given by the teacher.



Activity 4

My experience

Narrate your experience as you went through the 'visual imagery' activity.

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Activity 5

Game charades

Participating in this game ensures relief from physical and mental stress to a great extent.

Description of the game

Divide the class into equal member groups. One member from each group picks up a piece of paper kept in a hat. He must then tell his group members the name of the game written on the paper. With the accompaniment of music, each group must enact the game in front of the other groups. No dialogue is permitted. The other groups should carefully observe the group which is performing and try to identify the game and understand the details of the game. The game charade comes to an end after the stipulated time. Each group may discuss the information gained about the games with other groups and make a note of it (for example: no of players, equipments required, photos and pictures of the game etc.).

Points to remember

Since this game is played with the accompaniment of music, the physical activities involved are enjoyable. It also helps in avoiding physical and mental stress and worries to a great extent.

Activity 6

My experience

Narrate your experience on playing 'Game Charades'.

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Activity 7

Music Freeze Dance

Music freeze dance is an activity in which school students of any age can participate. Since the game involves a lot of movement, it helps reduce stress to a great extent.

Description of the game

According to the availability of space, the children position themselves as far from each other as possible. Ensure that there are no obstacles in the room. Students, according to their ability, dance with the tempo and rhythm of the music using a variety of fast moving steps. No other sound should be produced. Stop the music at fixed intervals. When the music stops, the dancers freeze on the spot. They continue to dance when the music resumes. The game can be played by making the children stand in different formations. (For example: triangle, circle, etc.).

Points to remember

- *As the game can be played inside the classroom, it relieves the stress that builds up in the class.*
- *This activity can be used as a warm-up activity of more difficult physical activities.*

Activity 8

My experience

Narrate your experience on playing the game 'Music freeze dance'.

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Yoga



Yoga is a 5000 - year old practice or discipline based on Indian philosophy and thought. It is a combination of exercise, breathing, proper food habits, relaxation and meditation. The primary aim of practising yoga is to gain physical and mental health. Yoga



helps to prevent diseases and to improve immunity.

The daily practice of yoga helps to sustain one's enthusiasm and indulge in day-to-day activities efficiently and promptly. The famous Indian scholar Patanjali was the first to introduce yoga as a scientific method of health care. He is the one who discovered that yoga can be used to sooth a worried mind, thus improving health and body fitness.

Yoga is an independent path of one's mind. Through the practice of yoga we can free our mind from anxiety, fear, loneliness, stress, etc.

Yoga is a way of life that helps in keeping away mental instabilities and worries – Patanjali

The following physical and mental states can be attained by practicing yoga as a part of one's life style:

- Reduces mental conflict or dilemma.
- Strengthens muscles by increasing blood circulation.
- Balances the pulse rate and blood pressure.
- Improves the lung capacity to hold breathe.
- Helps to fight heart diseases.



Things to be taken care of before practising Yoga

- Spread a thick sheet or mat on the floor before you begin yoga.
- Practise yoga early in the morning after your morning routine/ablutions.
- It is ideal to practice yoga in the morning or evening before food. If you had taken food, ensure that you practise yoga only after its digestion.
- It is good to begin the yogasanas after a few warm-up exercises that give mobility to the joints.
- A beginner should practise yoga under the guidance of an expert.
- People of all ages (preferably above 10 years) can practice yogasanas. However, you must select the asanas that are suitable to your age and ability.
- Difficult yogasanas should begin mildly. Through constant practice you can achieve perfection.
- If you feel tiredness, panting or any other discomfort while doing the yogasanas, you can give rest to your body through savasana/makarasana.
- While doing yoga, exhale when you bend forward and inhale when you stretch backward. Breathing through your nose is advisable.

Do you Know

As per the directions of the Human Resources Ministry, the NCERT has made Yoga a compulsory part of Health and Physical Education in Central Government schools from Classes 6 to 10. The syllabi and teaching materials for the same have been released.



Light exercises that can be done before yogasana (Warming up Exercises)

Sit down by stretching your legs forward. Sit straight and place the hands on both sides with fingers pointing backwards. (Fig. 2.4)

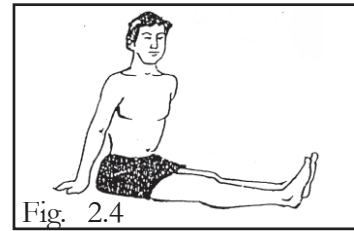


Fig. 2.4

Toe Bending

Stretch the feet forward and backward by keeping the toes together. (Repeat 5 to 10 times). (Fig. 2.5)

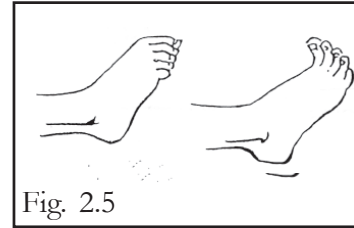


Fig. 2.5

Ankle Bending

Keep the feet together and stretch forward and backward (Repeat 5 to 10 times). (Fig. 2.6)

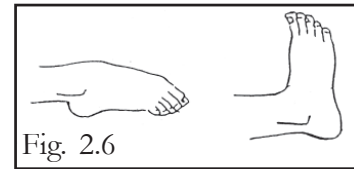


Fig. 2.6

Ankle Rotation

Keep both legs at a certain distance, first rotate the right foot (5 to 7 repetitions) and then in the opposite direction. This may be done with left leg and then with both the legs together. (Fig. 2.7)

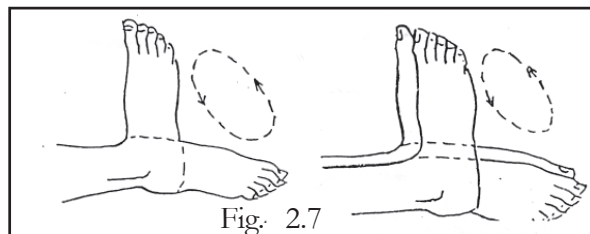


Fig. 2.7

Knee Bending

Bend and straighten the knees as shown in the picture (Fig. 2.8). Keep the hands under the knees and repeat the same on the other leg. (Do this for 5 to 10 times).

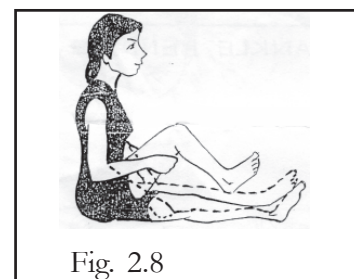


Fig. 2.8

Hand Clenching

Clench and stretch your fingers for 5 – 10 times. (Fig. 2.9)

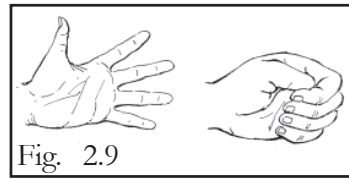


Fig. 2.9

Wrist Bending

Move your wrist up and down as shown in the picture. (Do it 5 – 10 times). (Fig. 2.10)

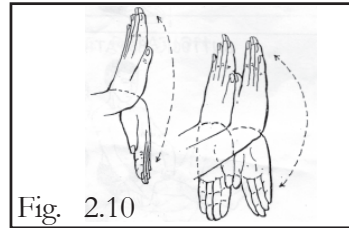


Fig. 2.10

Wrist Rotation

Rotate your wrist to the right and the left. (Repeat 5 – 10 times). (Fig. 2.11)

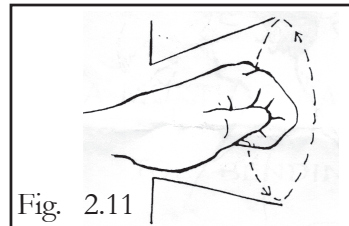


Fig. 2.11

Elbow Bending

Extend and fold both your arms to sides. (Do this 5 – 10 times). (Fig. 2.12)



Fig. 2.12

Neck up and down

Close your eyes and slowly bend head up and down. (Do this for 3 to 5 times). (Fig. 2.13)



Fig. 2.13

Neck side to side

Move your head to both sides slowly and steadily for 3 to 5 times, as shown in Fig. 2.14.



Fig. 2.14

The following are the asanas to be introduced in this class.

- Halasana
- Vakrasana
- Vyakhrasana
- Vrikhshasana
- Ushtasana

Activity 9

Halasana

Lie on your back with arms on either side and legs close together. Raise your legs slowly and gently move them to the back of your head without bending the knees as shown in the figure 2.15. Try to touch the floor with your toes. Then bring back the legs back to its previous position and end the asana.

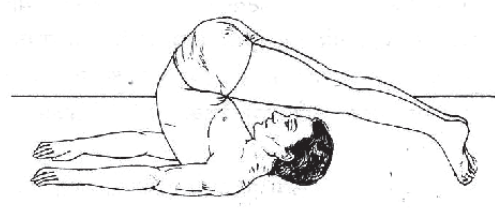


Fig. 2.15

Benefits

- Improves digestion.
-
-

Activity 10

Vakrasana

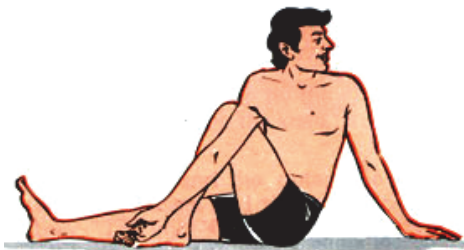


Fig. 2.16

Stretch your legs and sit straight on the floor. Bend the left leg and place it near the knee of the right leg. The right leg should be kept straight. Bring your right hand over the left leg and place it near the left feet as shown in the figure 2.16.

Keep the palms of the left hand firm on the floor behind you. Turn your head and look back. Ensure that the right leg, left arm and hips are not bent. Do the same activity on the other side too.

Benefits

- Strengthens the muscles around the hip and increases flexibility.
-
-

Activity 11

Vyakhrasana

Bend your knees, stoop forward, place your hands on the floor with elbows straight and sit. Hold your face up and keep your eyes open. Gently move your right leg backward, and then upward, to form an arc as shown in the figure. 2.17. Keep the back arched inwards. Remain in this position for a fixed time. Then bend the hips, lower the legs, bend your head and bring the

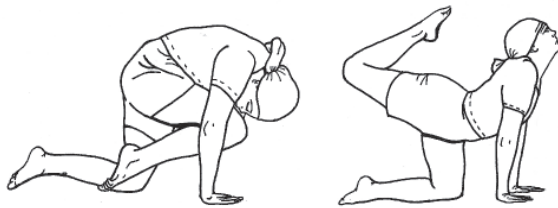


Fig. 2.17

leg close to your nose and hold the body in this position. After some time get back to the earlier position. Repeat the exercise on the other side.

Benefits

- Helps for proper digestion
-
-

Activity 12

Vrikshasana

Stand tall and straight with legs together and arms close to the body. Bend the right leg and place your right foot on the thigh just above the left knee as shown in the figure 2.18. Raise your arms over your head and bring the palms together in the ‘namaste’ position. Remain in this position for some time. Then, bring down the hands and legs to the previous position. Now, repeat the activity on the other leg.



Fig. 2.18

Benefits

- Improves concentration
-
-

Activity 13**Ushtrasana**

Sit in the vajrasana posture. Gently arch backward. Try to hold the heels of your feet with your hands. Hold your head backward and stick out your stomach as much as possible (Fig. 2.19). Remain in this position for some time. Then, slowly get back to the Vajrasana posture.



Fig. 2.19

Benefits

- Stimulates the respiratory organs.
-
-

Activities to improve the components of performance - based physical fitness

You have learnt in the earlier classes about health-related physical fitness and the physical activities to develop it. In addition to the basic physical fitness factors, it is essential to know about physical fitness factors that are performance-based, such as speed, agility, coordination, balance, strength and reaction time. Awareness about the above mentioned factors are essential for leading an effective and healthy lifestyle amidst the busy schedule of modern world. To excel in the field of sports and for an excellent performance, it is extremely essential to develop the performance-related physical fitness components.

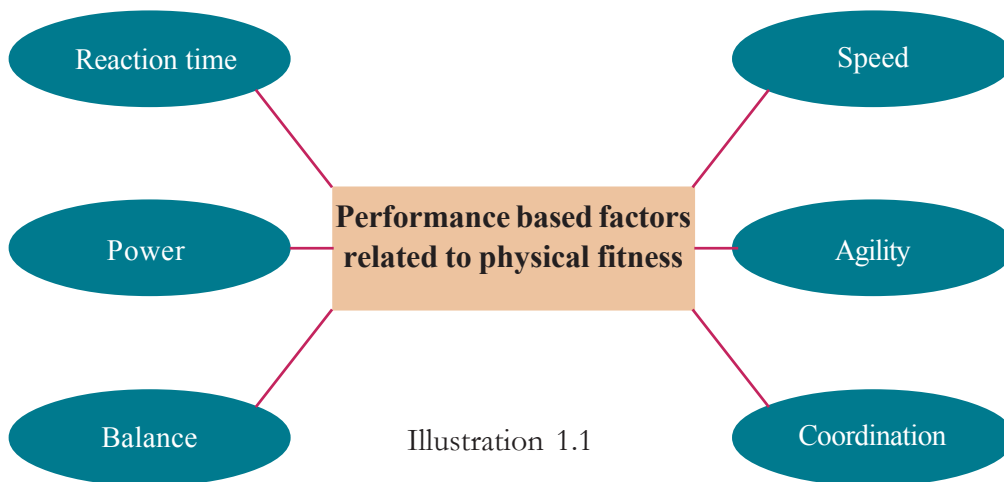


Illustration 1.1

Benefits of exercise

- *Heart becomes big and strong.*
- *Rate of heart beat decreases.*
- *Heart regains the normal heart beat rate quickly after strenuous physical activity.*
- *By the expansion of capillaries, the body tissues gain greater energy.*
- *Haemoglobin level in the blood increases due to an increase in the red blood corpuscles. This increases the ability of blood to carry the oxygen content.*
- *The quality of blood that flows out with every contraction of the heart increases.*
- *The inhalation and the exhalation power of lungs improves.*
- *The air that remains in the lungs after exhaling is more in individuals who engage in physical activities.*
- *The muscles involved in the respiration process is strengthened.*
- *Normal breathing levels are restored quickly after strenuous physical activities.*

Exercises that could boost both speed and agility in a combined manner are possible. By doing such exercises one can enhance the physical fitness components and improve the cardio vascular ability, balance and coordination.

To reach high performance levels in games and athletics one has to practice the following exercises.

Activity 14

Cone Taps

Through high knee action you have to touch the cones in front of you with your feet. Do not stamp on the cones or kick them aside. Begin slowly and increase the speed gradually. Repeat the activity 3 times, each with 30 seconds duration.



Fig. 2.20

Activity 15

Skills developed through Cone Taps

- Agility
-
-

Activity 16

Narrate your experiences after completing the activity Cone Taps.

.....

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Activity 17

Lateral Hurdle Jump

Hurdles or cones 1 to 2 feet high are used for this game. They are kept equidistant from each other (2 feet). Lift your knees and jump over 5 cones/hurdles to the sides. Do this for a duration



Fig. 2.21

of 30 seconds. Repeat the activity 5 times. Begin slowly and increase the speed gradually.

Activity 18

Skill developed through Lateral Hurdle Jump

- Agility
-
-

Activity 19

Narrate your experience after completing 'Lateral Hurdle Jump'.

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Activity 20

Zig Zag Cones

Around 5-10 cones are arranged in a zig zag pattern. Each cone is kept at a distance of 6 feet and at an angle of 45 degrees. When the whistle blows start running fast from the starting point which is 6 feet away from the first cone. Run around each cone and complete the race. Ensure that when you are running around the cone, your knees are in the squat position.

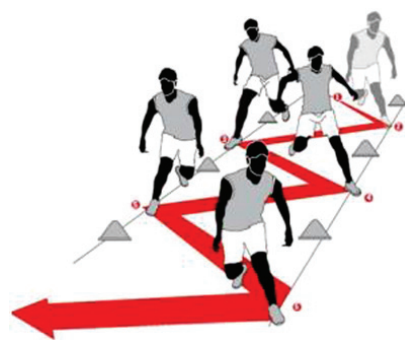


Fig. 2.22

Activity 21

Skills developed through Zig Zag Cone

- Coordination
-
-

Activity 22

Narrate your experience after completing 'Zig Zag Cone' Activity.

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Activity 23

Stair Running

This is a good exercise to enhance speed, strength and cardio vascular efficiency. You can make use of the stairs in schools or in your stadium for this purpose.

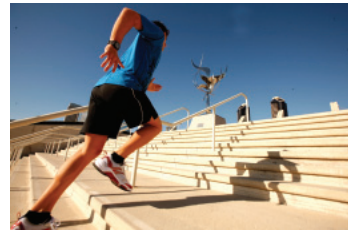


Fig. 2.23

Points to be remembered while doing the exercise.

- Warming up should be done properly before doing this exercise.
- Run up the stairs stepping one at a time.
- Do this exercise only for two days a week.
- Ensure safety by using the appropriate sports equipment like shoes, pads, etc.

Activity 24

Skills developed through Stair Running

- Muscular efficiency
-
-

Activity 25

Narrate your experiences after completing the 'Stair Run' Activity.

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Assessment

1. Based on your experience write a note on how physical and mental stress is reduced by engaging in physical activity.
2. Explain the importance of yoga in the modern life.
3. Describe certain exercises that can be done to enhance the components of performance-based physical fitness.

3

Sports World Free from Drugs

Learning Outcome

- Recognizes certain unhealthy tendencies that prevail in the field of sports and thereby the need to abstain from them.

We are often wonder-struck by the marvellous feats and skills of sports stars who stand aloft in the world of sports. But there are sports personalities who use certain unhealthy practices to attract the attention of the world and also to make money. These unhealthy practices include the use of stimulants and drugs. Such practises have pulled down many sports personalities from the peaks of fame to the abyss of disgrace. This lesson discusses the injurious effects of substances such as stimulants and drugs on human beings.



It was the finals of the 100 meter dash (run) in Seoul Olympics 1988. Ben Jonson set the world record by finishing in 9.79 seconds, which was described then as unbelievable and superhuman. But three days later, it was proved that he had used drugs during the event. The gold medal was taken back from him. He thus became an object of shame before the world. Ben Johnson may be the name that comes to mind first when a reference is made to the abuse of drugs.

Activity 1

You would have read the note on Ben Jonson. Many were caught in the similar manner on abuse of drugs. They were banned from their events as well. Now, write down a similar incident in sports that you have come across.

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In the 1960 Rome Olympics, Denmark's Cyclist Knud Enemark Jensen fell down unconscious and died during a competition. On examination it was found that he had had used drugs like, Amphetamine and Nicotine Tartrate.



Drugs are used by those who contest in sports that need more power (e.g. weight lifting, wrestling, throw events in athletics), long duration items (e.g. long distance race, cycling) and items that need greater concentration (e.g. archery, shooting). Various types of drugs and the unethical benefits they provide are given below. Such methods provide instant benefit but are severely harmful to the human body. These drugs are prohibited in the world of sports today.

1. Steroids - enhance strength
2. Stimulants - to improve concentration and prevent fatigue
3. Hormones - enhance strength and endurance of the cardiac and respiratory muscles.
4. Narcotics - suppress pain
5. Diuretics - reduce the water content in the body and thus bring down body weight.

Observe the illustration given below. Be aware of the harmful effects of drugs on different organs of human body.

Heart and the Circulatory system

Steroids : Blood circulation is affected as the blood vessels get hardened, thus resulting in cardiac arrest.

Hormones : Density of the blood increases. Blood pressure shoots up. Blood coagulates.

Diuretics : Low blood pressure, block in blood circulation.

Stimulants : Hypertension, abnormal heart-beat, cardiac arrest, block in blood circulation.

Sexual Organs and the Reproductive system

Steroids : Shrinking of the breasts, changes in menstrual cycle, excessive growth of body hair and masculine voice in women.

In men, growth of breasts, shrinking of testicles and reduction in semen count.

Hormones : Menstrual cyclic changes, formation of cysts, deformity of ovary and uterus.

Nervous system

Steroids : Excessive aggression, memory loss, concentration loss.

Lungs and Respiratory system

Narcotics : Affects breathing.

Kidney and the Excretory system

Diuretics : Loss of water from the body, kidney failure.

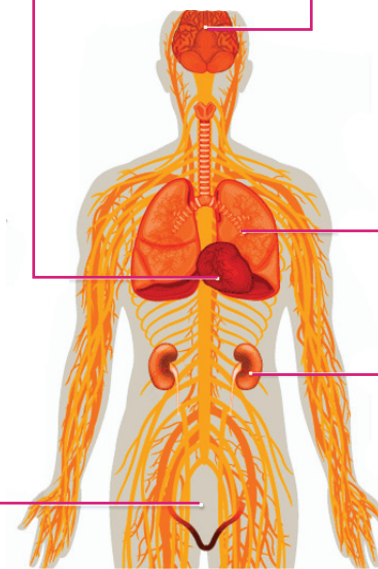


Illustration 3.1

Drugs are substances other than food materials, that are drawn into the body either to expedite or slow down our physical and mental activities. Though drugs are used in the treatment of diseases, their excessive or untimely use is considered as drug abuse. This sort of abuse leads to drug addiction.

Activity 2

Discuss and write down the health and social problems created by drug abuse.

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Drug abuse affects our intellect. Games can enhance our intelligence and memory. Let's move on to one such game.

Activity 3

Tell me the order

Students form a group comprising of 5 to 10 members. One from the group is selected as “teller”. Thus the members of the group pass a football among them. Those who pass over the ball should remember the person to whom the ball was



Fig. 3.1

passed. This should also be noted by the teacher concerned. After five such passes are completed the teller should tell the names of those who received the pass in the proper sequence. Likewise, all the members of the group get their turn to be the teller. Those who tell the correct order will move on to the next stage of the game and have to tell 6 passes in their order. If they could say the names in the correct order, they can move on to the next stage. The game would continue until one becomes the winner.

- Did you enjoy the game?
- Do you think that the game can help to enhance memory?

Activity 4

Find out answers for the following questions.

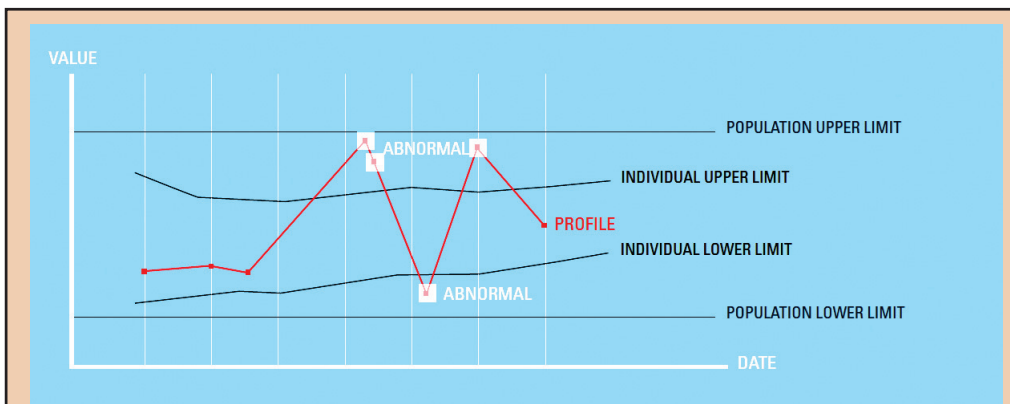
1. What is the volume of blood in human body?.....
2. Which are the types of cells found in blood?
3. What are the functions of red blood cells?
4. What are the functions of haemoglobin?
5. Does the count of red blood cells affect the physical activities? If yes, how?
.....
.....
.....
.....

Blood Doping

Blood doping is an unethical method of increasing the count of red blood cells to attain success in long distance competitions. Stimulative drugs are often used for this (eg. Erythropoietin). Blood doping is also done by injecting red blood cells, which are separated from the blood taken from one's own body or collected from others and kept frozen for days, into the body just before the competition.

The ill-effects of blood doping

1. Density of the blood increases causing the flow of blood to slow down, thereby leading to heart attack and stroke.
2. Diseases may spread through blood.
3. Can cause liver diseases and its eventual destruction.
4. Can badly affect pituitary glands and shoot up cholesterol.



Professional athletes are subjected to various examinations, thereby keeping a record of information on the presence and quantity of various substances and ingredients in their body. This is known as biological passport. On later examinations if apparent variation is found in the details with that of the biological passport, it can be inferred that the person has consumed drugs even without examining him/her further.

Sportsmen mainly use drugs to increase strength and to perform well in competitions. You would have understood the dangerous consequences. We can enhance physical quality through the intake of nutritious food and systematic training. Even different games are good enough to improve the physical ability of children. Let's familiarise one such game.

Activity 5

Pushing out

Two children are made to stand in a circle having a diameter of two metres. Both of them stand opposite to each other placing their hands on the right and left shoulder of their opponent. As per the instructions from the

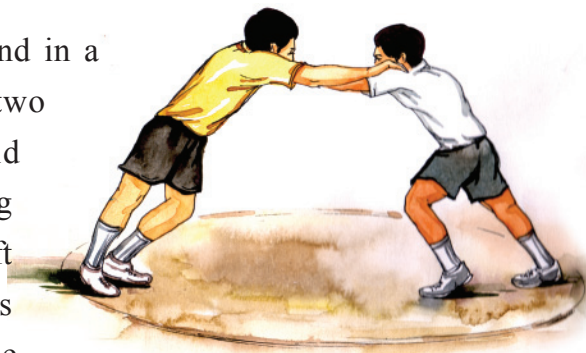


Figure 3.2

teacher, each one should try to push the other out of the circle, without taking the hands away from the other's shoulder. The person who succeeds in pushing his / her opponent out of the circle becomes the winner.

The game continues in the same manner giving opportunity to all the children by forming pairs. The winners move on to the next level. The game can continue till the winner of the class is found out.

Which component of physical fitness is improved through this game?

.....

It is the need of the society to erase the abuse of drugs from the world of sports. This will help to have healthy competitions, attract more people to the world of sports without worries and live a long and healthy life.

Assessment

1. Name the stimulative drug that brings down the count of semen?
.....
2. The method of increasing the count of red blood cells through the use of drugs is known as
.....
3. Suggest the actions that can be taken to put an end to the abuse of stimulative drugs.
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.....
4. What is the message that you have imbibed from this lesson?
.....
.....

4

Sports Culture Through Scientific Exercises

Learning Outcomes

- Acquires life skills that help in personality development
- Nurtures a physical culture through scientific exercises

The Grand Maracana Victory of Uruguay

Brazil met Uruguay at Maracana Stadium in Brazil to decide the winner of the 1950 World Cup Football Tournament. Even a draw could help Brazil lift the cup. Besides they also had the support of over 170000 spectators. After a goalless first half, Brazil scored their first goal in the 47th minute. The stadium broke into applause, almost sure of Brazil's victory. At this moment, Varla, Uruguay's captain, placed the ball on the middle line for kick off and turning to his team-mates cried aloud "Now it's time to win". Standing amidst the ecstatic crowd he roared, "After ten seconds there will be heard only one sound in this stadium. And that will be mine". Inspired by these words the team mates began playing with a rejuvenated spirit. In the 67th and 79th minutes they scored goals, with the packed stadium watching in stunned silence. Uruguay won the match.



We can find numerous such incidents in sports competitions. There are occasions when teams or individuals have won matches getting inspiration due to the timely intervention of the team captains or coaches. Share and discuss similar incidents.

Through participation in different types of games, we can acquire various life skills like leadership quality, discipline and self-confidence.

Self-confidence : Self-confidence might be termed as the belief an individual has in his/her own ability, quality and decisions.

Leadership skills : The ability to lead others to a common goal.

Discipline : A personality trait that helps one to do the right thing in the right way at the right time.

Activity 1

Blind Football

The class may be divided into teams comprising of nine students each. Each team is further subdivided into groups of three. Two members of each subdivided group should cover their eyes with handkerchiefs. The three groups in a team shall then be brought for action in the field. When the start signal is given the team can start the game by kicking the ball and scoring goals. Only the six blind-folded students of a team shall kick the ball.

- One group alone shall not keep kicking the ball continuously.
- Two members of the same group shall kick the ball alternately.
- The person who has not covered his/her eyes in the group shall give directions to the other two by firmly holding their hands.

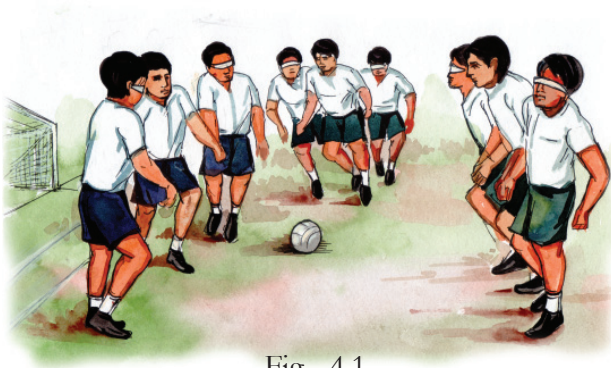


Fig. 4.1

- If the ball goes out of the fixed area limit, the team loses its chance to play.
- The team that scores within the shortest time shall win. The match can also be conducted by the rule that the team which scores the maximum within the fixed stipulated time will be declared winner.

To win this game, the person who is not blindfolded needs leadership qualities and good communicative skills. By changing the players, such qualities can be tested among all the students. Great self confidence is attained by kicking the ball blindfolded. Moreover, discipline is also necessary to move ahead following the directions of the team leader. In this way many qualities that contribute to personality development can be acquired through games.

Nirmal, a student, goes to a gymnasium daily to do exercise. He has no knowledge about the ways and means of doing exercise. Nirmal did the exercises by watching and imitating others as there were no teachers or instructors or charts that contain directions for doing exercises. As such, there were flaws even in the selection of exercise. When the class teacher noticed the absence of Nirmal who was a regular student, she called up his father. His father informed that his son was hospitalised with backache due to the unscientific training he had at the gymnasium. Nirmal had been doing exercises only for the upper part of his body. This was pointed out by the doctor who examined Nirmal. He did not know about the injuries that could happen if weight exercises were not done in a systematic and scientific manner.

Scientific approach is very important when we exercise. Nirmal's experience is only one such example. Similar mistakes could occur in playfields as well. What scientific aspects of exercise should a person know before practising it?



Various types of muscles in the human body

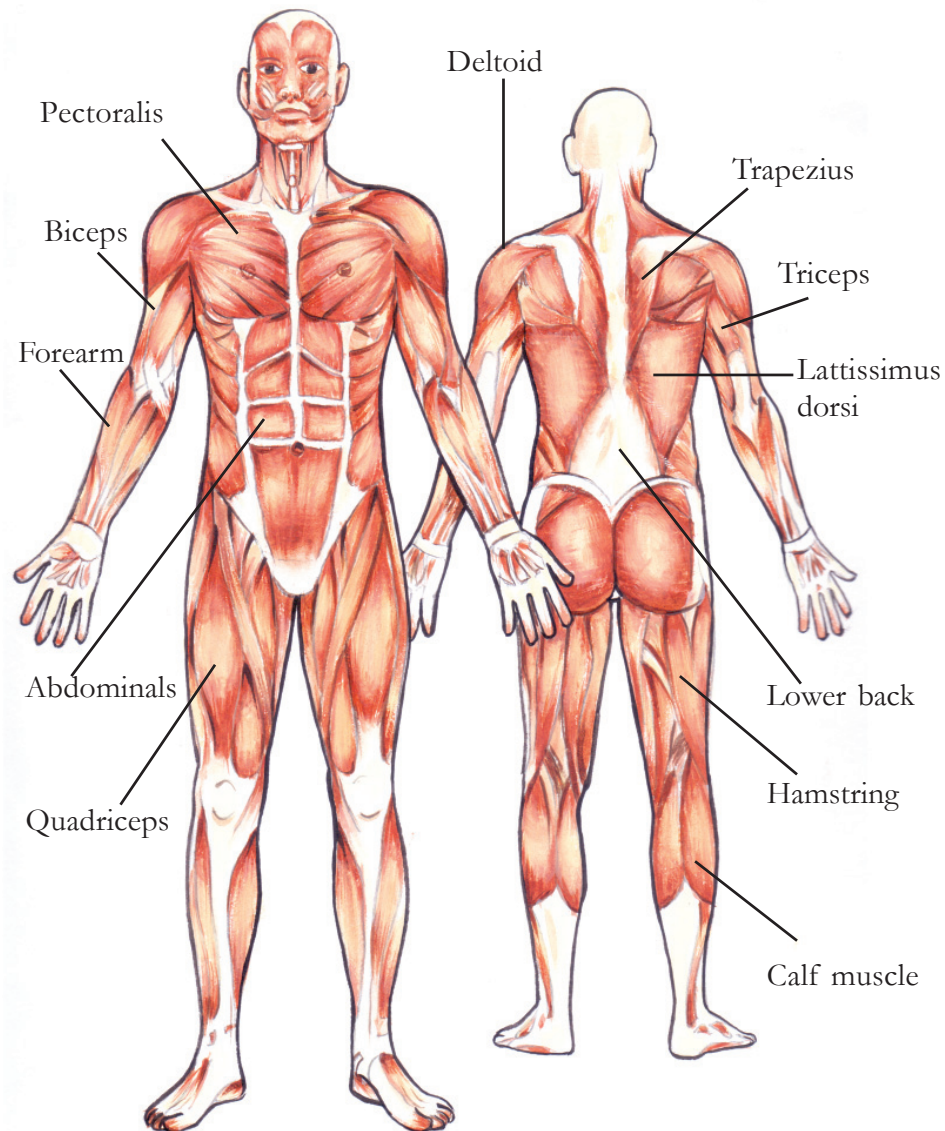
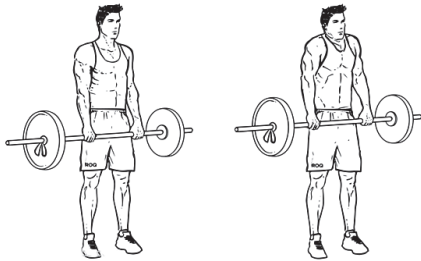


Illustration 4.1

You are now familiar with the various muscles in the body from the illustration. Let's now see the exercises to strengthen them.

Methods of exercise for various muscles : Illustration



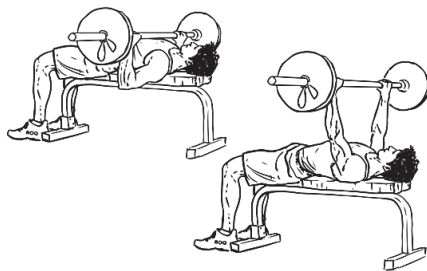
Trapezius - shoulder shrug

Fig. 4.2



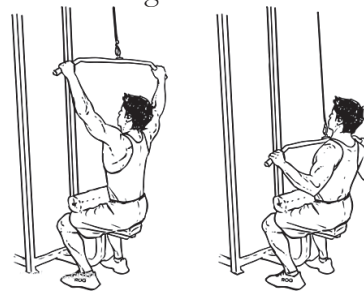
Deltoid - front press

Fig. 4.3



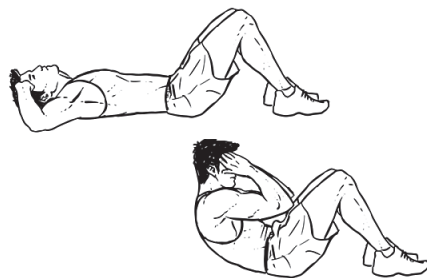
Pectoralis - bench press

Fig. 4.4



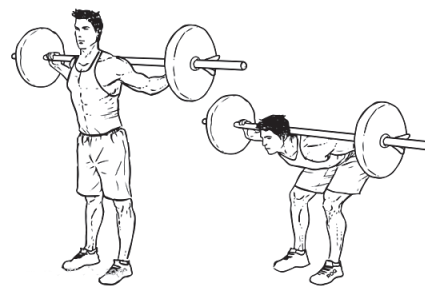
Lattimus dorsi-lateral pulldown

Fig. 4.5



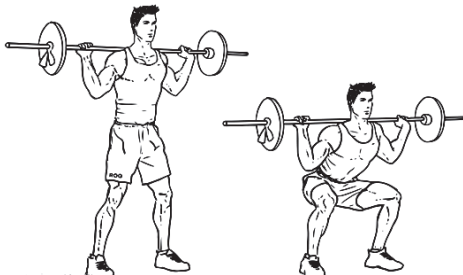
Abdominals - situps

Fig. 4.6



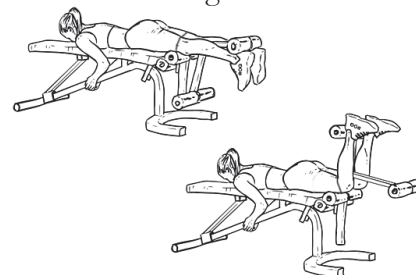
Lower back - goodmorning

Fig. 4.7



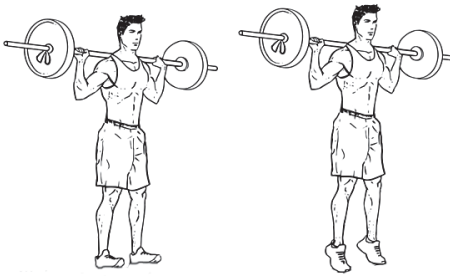
Quadriceps - squat

Fig. 4.8



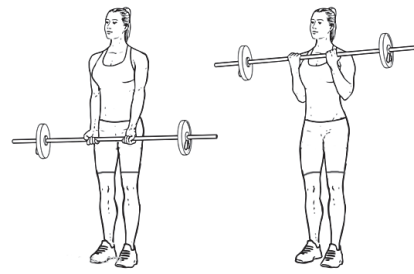
Hamstring - legcurl

Fig. 4.9



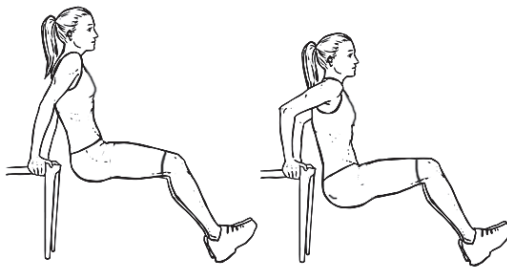
Calf muscles - heel rise

Fig. 4.10



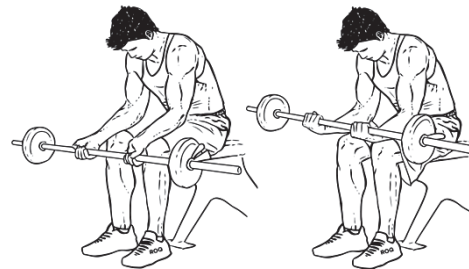
Biceps - biceps curl

Fig. 4.11



Triceps - triceps dips

Fig. 4.12



Forearm - wrist curl

Fig. 4.13

Guidelines for Weight Training

- *All the muscles in the body should receive exercise.*
- *Training should be arranged in such a way that the bigger muscles are exercised first. e.g. Exercise for the arms should be done only after giving exercise to the legs.*
- *When exercise is done for muscles present at a point in the body, exercises that involve more than one joint should be done first. e.g. Biceps curl has to be done only after doing front press.*
- *When exercising opposite muscle groups, training should be done one after the other with equal intensity. e.g. Exercises for Hamstring muscles shall be given after that for the Quadriceps muscles.*
- *During exercise, the posture and movement of the body should be correct. Hence, beginners should do exercises involving weight lifting only in the presence of a trainer.*

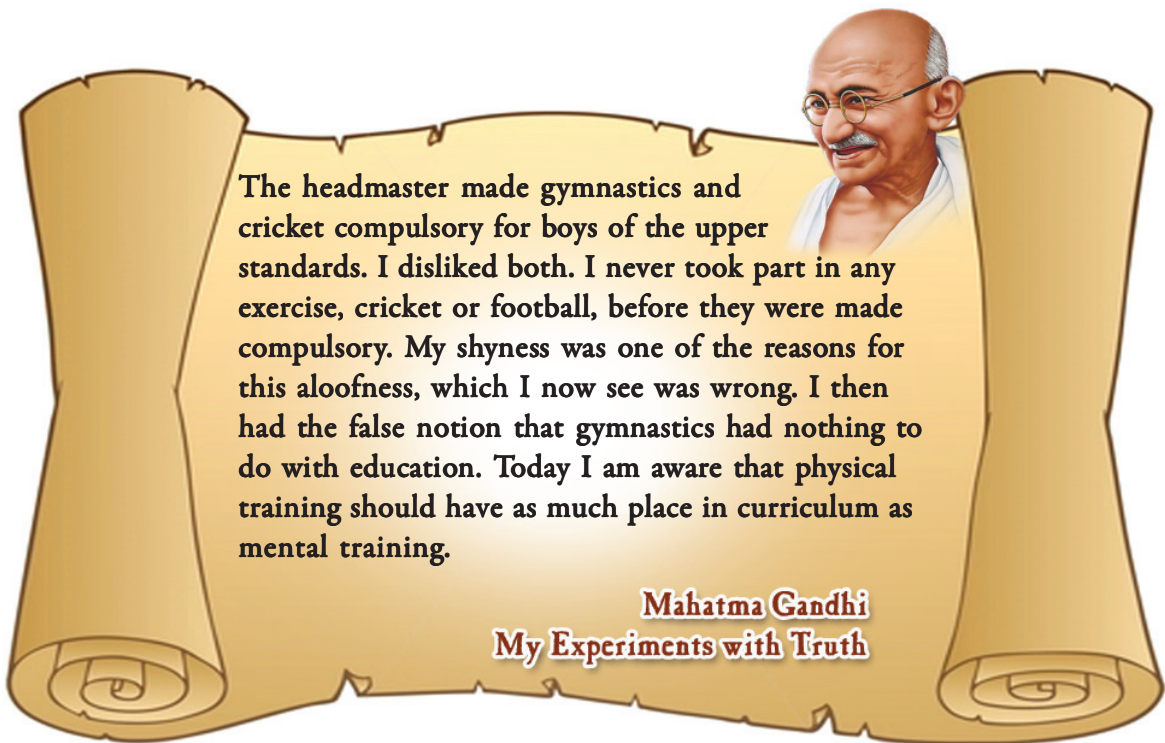
- *Warming-up and cooling down activities are to be done before and after exercises respectively.*
- *Beginners should use only moderate weight. Once the weight becomes comfortable and easy, the weight can be increased by five percentage.*
- *It is advisable to do weight training 3 to 5 days in a week. If the muscles are given a rest of 24-48 hours duration, it would help in their growth.*
- *To attain physical fitness, it is desirable to choose a weight that can be done 8-12 times in a single set. 1-3 sets can be attempted.*

Activity 2

Prepare a day's training schedule based on the various exercises with which you have become familiar in this unit.

Exercise	Number of times	Set
Squat	8	2

Table 4.1



These are Gandhiji's words on physical training. A sports culture can be evolved through the inclusion of physical education in curriculum so that physical training becomes a habit. What is your opinion regarding this? Discuss.

Activity 3

You can evaluate how much you exercise.

Put a tick mark (✓) against the statements, which you find true with respect to yourself.

- Do strenuous physical tasks at home and school
- Participates in sports and games
- Day-to-day activities provides physical exercise
- Do exercises daily for half an hour
- Do not use vehicles to travel short distances
- Hobbies include at least a few physical activities

It can be safely assumed you are getting sufficient exercise necessary for good health if there are more tick marks.

Points to be noted while doing exercise

- *Try to set aside at least 30 minutes for exercise.*
- *Make warming-up and cooling down activities a habit.*
- *Avoid strenuous exercise.*
- *If the pulse rate is above 100 per minute, after five minutes of exercise, bring down the intensity of the training.*
- *If possible, exercise in the morning as the quantity of fresh air in the atmosphere would be higher at that time.*
- *If intolerable pain or difficulty is experienced, don't hesitate to receive the directions from specialists.*
- *Avoid exercising when ill or injured.*
- *Take light food after exercise.*

Assessment

1. Which among the following is the most important skill that a leader should possess?
(a) sympathy (b) leadership quality (c) punctuality
2. Choose an exercise from the following which enhances endurance.
(a) jogging (b) shuttle run (c) push up

5

Exercise and Body weight Control

Learning Outcomes

- Realizes awareness about the various ways to control body weight.
- Identifies aerobic and anaerobic activities.
- Recognizes awareness about the diet practices while participating in sports activities.

Manu, a tenth class student, appeared for the selection trials of the school team participating in the sub-district Kabadi competition. But the teacher told him that only those who are less than 57 kg could participate in the competition. Manu weighed 70 kg. The teacher consoled Manu who sat distressed not being able to take part in the selection. This incident affected him, and he thought of measures to reduce his weight. He sought the help of the teacher in this regard.

Obesity is a life style disease of the modern age. Overweight (obesity) often causes numerous diseases like diabetes, heart attack, etc. Most people indulge in activities to reduce weight only after being affected by such diseases. Body weight (obesity) has to be controlled to prevent life style diseases and to ensure a long life. Let's see the various methods to control body weight.



Various methods to control body weight

1. Diet and body weight control
2. Exercise and body weight control
3. Body weight control through medical treatment.

1. Diet (regulated food consumption) and Body weight control

This is the method by which body weight is controlled through regulated food. Regulations are put in the food consumed daily, thereby reducing the volume of calories that enter the body. As such, the energy needed for daily activities is produced from glycogen and fat which are kept stored in the body. Thus, the amount of fat in the body decreases, and the body weight is reduced.

2. Exercise and Body weight control

This is the method by which body weight is controlled through participation in physical activities. When we take part in physical activities, the increased demand of energy is met by glycogen and fat



stored for the production of energy. As the duration of physical activity increases, energy is produced from the fat which is stored in the body.

3. Body weight control through medical treatment

In modern times different methods of treatments are used for the control of body weight. The most important methods adopted are medicines and surgery. When medicines are used to control the body weight, there are many side effects. Therefore, medicines should be used only on the advice of medical practitioners.

Studies have proved that natural products such as tea, coffee could reduce body weight.

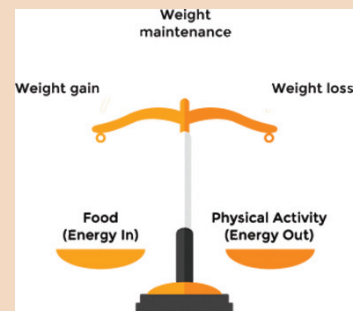
Lean Body Mass

Lean Body Mass is the total weight of tissues except fat that make up our body such as muscles, bones and blood. When the volume of fat gets more than 25% in an adult male and 30% in a female, it becomes obesity. Hence, the right proportion of the body can be achieved either by increasing Lean Body Mass or by reducing fat. When these two measures are taken together, the goal may be achieved faster. About 40% of the body weight of a man and 20% of the body weight of a woman are muscles. Hence, the Lean Body Mass could be effectively increased by increasing the muscle mass.

Make exercise a part of one's daily routine while regulating food to control body weight.

Positive Energy Balance, Negative Energy Balance

If a person gets energy from food more than his or her daily needs, it is positive energy balance. If less, it is negative energy balance. Positive energy balance causes weight gain whereas, negative energy balance results in weight loss.



Activity 1

Now, you might have understood the various ways to control body weight. Discuss and write down the types of physical activity one has to engage in, to reduce body weight and the points to be observed while regulating food.

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National Family Health Survey has identified that 12.1% of men and 16% of women in India are obese. But in Kerala 24.3% of men and 34% of women are found to be obese.

Aerobic – Anaerobic Activities

We have understood that the movement of the body is made possible by the expansion and contraction of the muscles. Energy needed for this expansion-contraction is chiefly obtained from the nutrients in the food like carbohydrates, proteins and fats. Physical activities are divided into two according to the availability of energy they need.

1. Aerobic activities

These are physical activities that produce the required energy in the presence of oxygen. The energy needed for aerobic activities are derived from carbohydrates, proteins and fat contained in food. While carbohydrates are utilized to produce energy in the early stages of aerobic activities, it is fat that produces energy as the duration increases. Usually, activities that last for more than two minutes are aerobic. Swimming, cycling, slow run, long-distance run, etc. are included among aerobic activities.



2. Anaerobic activities

Anaerobic activity is the method of producing the required energy for physical activities in the absence of oxygen. Energy needed for anaerobic activities is derived from carbohydrates. Anaerobic activities include those which have a duration of less than two minutes.



100 m race, 200 m race and weight lifting are some of the examples. The intensive and rapid actions which happen in between long duration activities also produce anaerobic energy. Sprinting in between football matches is an example.

Activity 2

Write down how the control of obesity is related to aerobic and anaerobic activities.

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Activity 3

Run with the ball

Form one or two groups of equal members. Students in each group should stand in a line behind the starting line. Directed by the teacher, the first student in each group would run



Fig. 5.1

forward holding the ball behind his/her back and come back encircling a cone placed 20 metres away. On crossing the starting line they once again run forward holding the ball in front of their body. After encircling the cone they



Fig. 5.2

run towards the starting line and hands over the ball to the second in the queue. All the members in the group follow the same method and the team which finishes first will be the winner.

1. Through which method, energy was mainly produced in this game?
Aerobic/Anaerobic.
2. Which is the main source of energy?
Carbohydrate/Protein/Fat.

Food regulation

Sportspersons participating in competitions need to follow a strict food regulation procedure. Food should be regulated in such a way as to get the required energy for the competitors. There must be changes in food procedure depending on the nature and duration of the sports activity. Food regulation can be grouped into three types.

- a) Before the match
- b) During the match
- c) After the match

a) Before the match

Food rich in carbohydrates should be mostly taken before competition. As fatty food needs more time for digestion, it should be avoided. Proper digestion would take place only if carbohydrate rich food is consumed at least three hours before the match. Indigestion might seriously affect the performance. Food in liquid form is good for speedy digestion. Sweets and sugary food taken just before a match would increase the glucose level in food resulting in an instant production of insulin. This would lead to a decrease in energy by bringing down the level of glucose. Moreover, it might cause loss of water in the body as well as vomiting, dysentery, muscular strain, etc.

b) During the match

Taking carbohydrate drinks during matches would prevent the decrease of glycogen stored in the body to a dangerous level. It would be desirable to consume a glass of 100 ml water mixed with 2 to 2.5 gram glucose. The

human body is able to intake approximately 800 ml water per hour. So it is not advisable to drink too much water during matches even though more water is lost in the form of sweat. The reason is that water-filled abdomen may hamper physical activities.



c) **After the Match**

Food that gives all kinds of nutrients should be taken after the match. It will be better to take food at least one hour after the match. However, nutrients in liquid form should be consumed soon after the match so as to retain the equilibrium of glucose level. If there are matches on the following days it is advisable to take easily digestible food in order to store glycogen in the muscles and liver. It is necessary to drink water depending on the rate of absorption to regain the water loss.

Activity 4

It is commonly seen that children taking part in school level competitions use glucose powder just before the beginning of a match. Write down how this affects the performance of the participants.

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Assessment

1. Which is the nutrient that provides energy for anaerobic activities?
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2. Which nutrient component produces more energy when the duration of the physical activity is prolonged?
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3. What should be the minimum duration between the match and food intake?
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