



Health & Physical Education

Activity Book

Standard IX



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.

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Typesetting and Layout : SCERT

Printed at : KBPS, Kakkanad, Kochi-30

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Dear students

A society cannot exist without certain features like communication, exchange of views and health care. Like languages, arts and science, good health care is also very essential for civilized life. Hence, the emphasis on Health and Physical Education in the contemporary education system. Sports and games not only provide energy and health but also the cultural sense to interact and share with the fellow beings and the ability to overcome challenges. They also train us in decision making and leading an organised life. This characteristic makes sports and games and health education an integral part of our life.

You are the citizens of tomorrow; you are the future leaders of the nation. A healthy and magnanimous society is essential for keeping the country united and undivided. We are all duty bound to achieve this noble goal, and each one of us has to strive hard to achieve it.

The activities in this book have been prepared keeping various such objectives in mind. Let's hope you will assimilate them fully, with help from your teachers.

Best wishes

Dr. P.A.Fathima

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1

Cardio-Respiratory Systems and Physical Activity

Learning Outcomes

- Attains knowledge about the outcomes of exercise on cardio-respiratory systems.
- Regularly participates in exercises.

Raju and his friends were waiting for their bus to school. The bus stopped a little away from the bus stop. They had to sprint hard to get into the bus. Raju was panting and puffing and felt tired on stepping into the bus. After getting down Raju asked his friend Anu, "Were you panting or feeling tired after running to catch the bus?"

Anu : In the evenings we run faster and cover more distance while playing football and so I didn't feel tired at all.



Raju : Really?

Anu : Yes, regular exercise improves the functioning of respiratory and circulatory systems.

Have you ever thought of an environment without air? The elements in the atmospheric air help for the sustainment of life. The respiratory and circulatory systems help to sustain life by making use of elements in the environmental air. A normal man's brain may be damaged if the oxygen supply is stopped in the brain for more than 5 minutes. Stagnation of the blood will result in blood clots. But this does not happen as blood is always in motion. It is the combined functioning of the cardio-respiratory systems that



Fig. 1.1
Respiratory
system



Fig. 1.2
Circulatory system

ensures the steady supply of O_2 and return of CO_2 and other metabolic wastes at the cellular level. The removal of inflammation caused by injuries and all waste products, including the lactic acid formed due to exercise, are cleaned by the circulatory system.

The respiratory and circulatory systems control the functions of the body. These systems change in accordance with the physical activities. Regular exercise improves the efficiency of these systems. Unhealthy life style and environmental pollution harms them seriously. The effect of exercise on these systems are explained in the following activities.

Activity 1

Based on the area of the playground, the members in a team may be fixed for a game of football. Before starting the game, all the students should record their pulse and respiratory rate, as



Fig. 1.3 Football

directed by the teacher. This may again be recorded immediately after the game and also after 5 minutes from the close of the play.

On examining the following, inferences may be drawn regarding the pulse and respiratory rate in the above activity.

1. There was an increase in pulse and respiratory rate after the game.
2. There was a significant increase in pulse and respiratory rate in some students.
3. The increase noted immediately after the game came down after 5 minutes and in some students it reached the rate noted before the game.

Around 24 lakh Indians die annually due to cardiac problems. Cardiac muscles control the functioning of the heart and the plural muscles control the lungs. Regular physical activities improve the functioning of these muscles, resulting in a better functioning of cardio-respiratory system.

Activity 2

With the help of your teacher, discuss and prepare a note on the causes for the increase in the pulse and respiratory rates after the game.

When a physical activity is started the metabolic rate at cellular level increases.

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On the basis of its intensity, physical activities can be classified as aerobic and anaerobic. Low intensity activity with intake of more fresh air (oxygen) can be called aerobic. When high intensity activity is done, more intake of air is not possible. This activity is called anaerobic.

Activity 3

In some children there were significant increase in pulse and the breathing rates after the game. The reason for this individual differences should be noted with the help of the teacher.

On the basis of cardio - respiratory efficiency, more blood and oxygen reach the cells. This results in the more efficient removal of carbon dioxide.

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Activity 4

The increase in pulse and respiratory rates, immediately after the game, came down after five minutes. It reached almost normal in some students. Why? Prepare a note on this and seek the help of the teacher, if required.

Recovery period is the time needed for the internal functions of the organs in the body to reach the normal stage. Even if the physical activities come to an end, the metabolic activities continue depending on the intensity of activities.

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Tidal volume - It is the amount of air inhaled or exhaled in a single normal breath. This will be more in the case of physically active individuals.

Vital capacity - It is the maximum amount of air a person can expel from the lungs after a maximum inhalation. This will be more in case of physically active people.

Residual volume - The volume of air remaining in the lungs after a maximal expiratory effort. This will be less in the case of physically active people.

Activity 5

Use two footballs at a time to play football as in Activity 1. When a goal is scored in any of the post both balls become dead and both the teams can resume the play from both end lines.

As done in Activity 1 pulse and respiratory rates should be recorded before the game, immediately after the game and five minutes after the game.

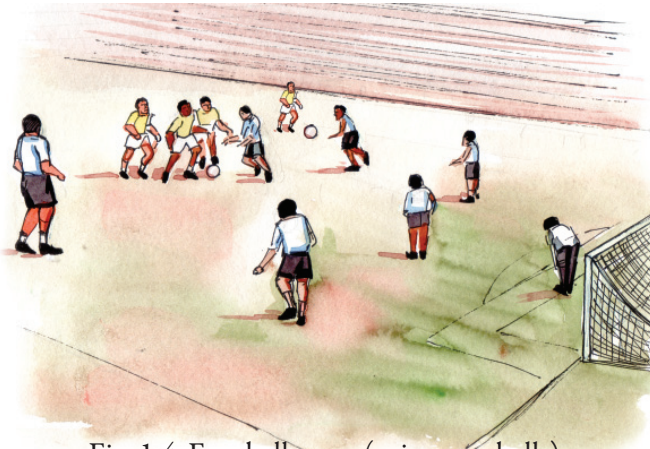


Fig. 1.4 Football game (using two balls)

Activity 6

Though Activity 5 is similar to Activity 1, there was a difference in intensity of the game. Prepare a note with the help of your teacher.

Intensity in Activity 1 was relatively low. Therefore it was more aerobic in nature. In Activity 5, the balls continuously come to both ends, which made the game more anaerobic.

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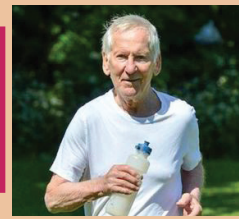
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Daniel Green, an English, aged 81, recorded a stunning pulse rate of 26 beats/min.



Activity 7

The maximum heart rate of an individual when he engages in exercises is calculated by reducing his age from 220. If the heart rate rises up to 50-69 percentage, it is considered as medium intensity. If it is below 50%, it is low intensity and above 69% is high intensity. Note down the intensity in both the activities in the space provided below.

a) Pulse

In Activity 1

In Activity 5

Maximum heart rate

Intensity

In Activity 1

In Activity 5

Rate of Intensity (Low, Medium, High)

b) Game (1) Game (2)

Activity 8

Record the rate of increase of respiration in both the games in the table given below.

Normal breathing rate in relation to age

Age	Breathing rate in minutes	
6 - 12 years	18 - 25	(1) Activity 1
Above 12 years	16 - 20	(2) Activity 2

Table 1.1

Activity 9

Explain in detail the life style to be followed to attain a healthy cardio-respiratory functioning.

Stigseverinsen, a Danish, was able to stand under water on a single breath for 22 minutes.



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Activity 10

Make a short note on how physical activities improve cardio-respiratory functioning.

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Assessment

1. Find the pulse rate immediately after getting up from bed early in the morning (resting pulse). After recording it, engage in exercises for a duration of half an hour per day for not less than six weeks. Measure the resting pulse rate once again and identify the difference.
2. Balloons of the same size given by the teacher may be inflated in a single breath after a deep inhalation.

If the inflation of the balloon is more, it can be assumed that you have a good respiratory function.



It can be noticed that after six weeks' exercise for half an hour each day, the balloon can be inflated more.

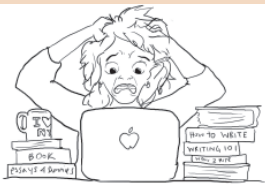
2

Stress Relief Through Play

Learning Outcomes

- Attains knowledge regarding the situations that lead to stress and the measures to tackle them.
- Improves the physical and mental fitness through yoga practice.
- Attains knowledge on the remedial activities by measuring physical efficiency.

What is stress?



Stress is a psychological, physical and emotional response to a stimulus generated from adverse conditions or needs that are not satisfactorily fulfilled.

Do you know

Various studies done among children globally prove that 13 out of every hundred children are victims of stress.

All humans experience stress in their life. This may cause physical or mental problems and retardation.

The stress that the children experience might be the result of their day-to-day activities. Home, school, surroundings,



and even interaction with the classmates may cause stress. The hormones to counter mental stress is produced in large quantity while engaged in play. So participation in plays helps to overcome stress. Including fruits and vegetables in the daily diet and drinking a lot of water help in minimizing the intensity of stress.

Activity I

List out the measures to minimize stress.

1. Include a lot of fruits and vegetables along with other nutritious food items in the daily diet.
2.
3.
4.
5.
6.
7.

Points which children should understand and follow

1. Your problems should be shared clearly with your parents at the right time. If you are not be able to share it with them in certain situations, then you can share it with someone you trust or seek to for finding a solution.
2. Find time to enjoy music. Close your eyes and concentrate on your breath and relax. Engage in your hobbies.
3. Stress can be reduced by increasing physical, mental and emotional efficiency through engaging in physical activities and play.
4. It is a wrong concept that intoxicant drugs can reduce stress.

Activity 2

Silent ball

Silent ball is a game that helps to reduce mental stress. It is enjoyable too. It should



Fig. 2.1

be played following the rules and according to the instructions of the teacher. Light balls made of soft leather should be used for the game.

Instructions

- Form a circle as per the instruction of the teacher. Use the ball given by the teacher to pass among your friends.
- Do not talk or make sound while passing the ball.
- You should not return the ball to the one who passes it to you. You should pass it to another friend. The ball should not be dropped.
- Those who talk or make sound and those who drop the ball while passing will be out of the play. The last two, who remain will be the winners.

Activity 3

You might have engaged in silent ball game. Write how these type of games minimizes stress.

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Activity 4

Deep Breathing Exercise

1. Stand straight, with your legs apart in tandem with the shoulder width.
2. Stand relaxed, keeping both hands down, close to your body.
3. Relax your body completely.
4. Close your eyes.

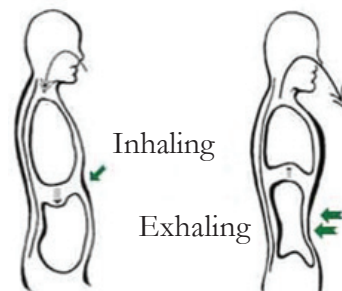


Fig. 2.2

5. Concentrate on your lower abdomen. Assume that a balloon is there.
6. Inhale slowly through the nose. Fill the abdomen with air and make the shape of a balloon. Hold it for a fixed time.
7. Release the air slowly through the mouth and bring the abdomen to the normal flat position.
8. Move the lower abdomen up and down. Breathing should be done as mentioned above.
9. Repeat this for more than 10 times.

Activity 5

Write down the changes you felt after doing the deep breathing exercises.

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Activity 6

Progressive Relaxation (Deep Muscle Relaxation)

This is an activity to prepare the muscles after an intense physical session or game and recover it in the original form to prepare the muscles to perform the activities of the next day or next session easily.

Order of activity

1. Raise your eyebrows and make wrinkles on the forehead, using both hands. Do this for five seconds and then relax.
2. Again make wrinkles on the forehead for five seconds and relax.
3. Slowly close your eyes tightly. Fold your lips inwards. Do this for five seconds and relax.
4. Open your eyes and mouth to the maximum. Hold it for five seconds. Feel the heat and energy on your face.
5. Stretch both hands upwards. Hold your fists for five seconds. Feel the warmth and energy on your hands.
6. Stretch your hands to both sides. Imagine that you are pushing a wall with your hands with maximum strength. Hold it like this for five seconds and relax.
7. Fold both the elbows of your hands to contract the biceps muscles. Continue this with full strength for five seconds and then relax. Feel the response felt on your hand and observe the energy.
8. Slowly lift both your shoulders up. Shoulder should raise so as to touch your ears. Hold them for five seconds and then relax.
9. On prone lying (lying on the back), bend the hands, place it backwards and slowly raise your body forward to form an arc (Bridge position). Hold for five seconds and then relax.
10. On prone lying position, tighten your abdominal muscles. Hold it for five seconds and then relax.
11. Tighten your gluteal and hip muscles. Hold them for five seconds and then relax.
12. Tighten both your thigh muscles. Hold them for five seconds and then relax.

13. Dorsiflex (Draw the toe towards the body) at the ankle. Hold it tight for five seconds and then relax.
14. Plantarflex (Draw the toe away from the body) at the ankle and hold it tight for five seconds and then relax.
15. Tighten your whole body for 10 seconds. Hold them and then relax. After that, realize the energy and enjoyment of the body and mind. Do this activity one or two times and enjoy the relaxation felt on your body.

Progressive muscle relaxation can be done from legs to head and vice versa at fixed time intervals. Different models are given below.

Model 1

Progressive Muscle Relaxation

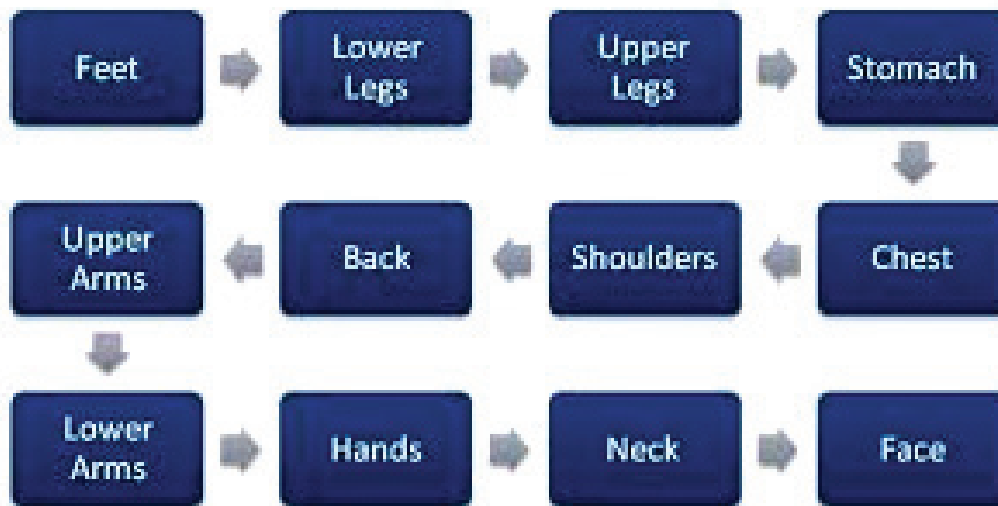


Fig. 2.3

Model 2

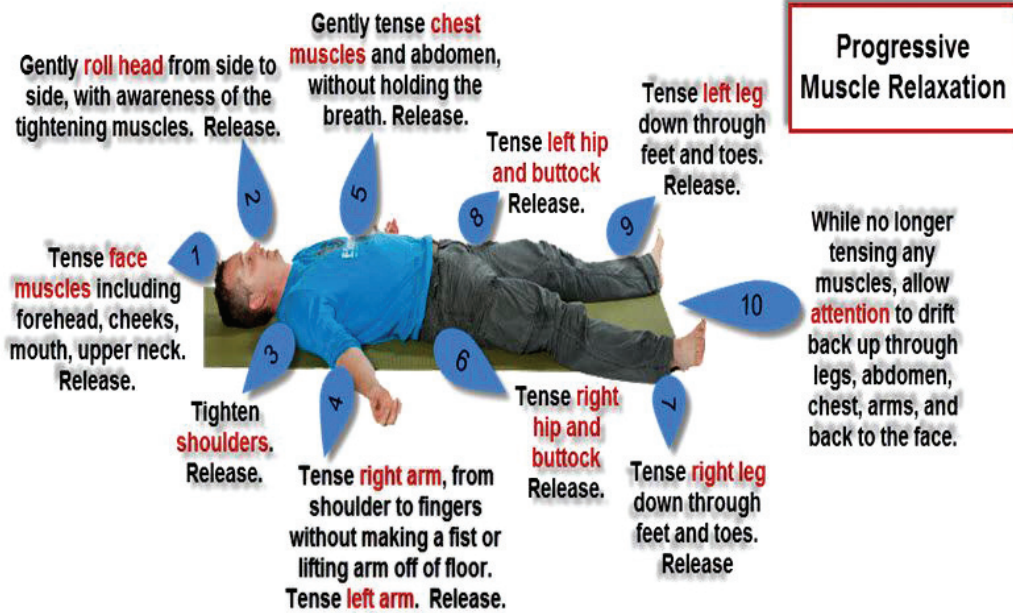


Fig. 2.4

Activity 7

My Experience

Explain the experiences you felt after involving in progressive relaxation (Deep muscle relaxation).

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Yoga

"Yoga is a practice to calm the mind". - Patanjali

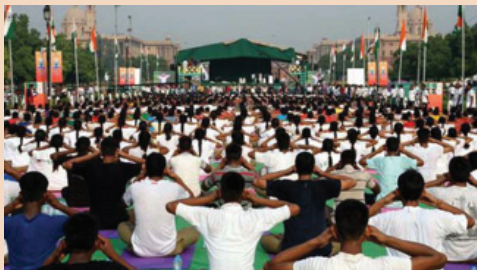


Yoga has a high significance in modern life. Man's life is haunted by many diseases and yoga gains much importance in this situations. By practicing yoga your body and mind achieve a state of stability. Resistance and relief from diseases are possible through practicing yoga.



International Yoga Day

The UN General Assembly convened on 11 December 2014 proclaimed that the International Yoga Day should be observed every year. For this, 21 June, the longest day in the year was declared the International Yoga Day. The first International



Yoga Day was observed world wide on 21 June 2015 in 175 countries, including America, Canada, China and India.



Things to remember before yogasana

- Spread a hard bedsheet or floor mat for practicing yogasana.
- It is desirable to practice yoga after your morning routines.
- Better to do yoga in the morning or evening before food. After food, it should be practised after allowing enough time for digestion.

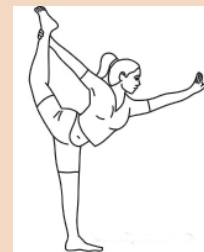
- It is desirable to start yogasanas after doing some warming up exercises that provide free movement to the joints.
- In the beginning, yoga should be practised under the guidance of an expert.
- Yogasanas can be practiced at all ages (above 10 years is desirable). But select asanas which suit to one's age and ability.
- Exhaustive asanas should be done lightly. Through regular practice, you can gain perfection in such asanas.
- If you feel tired, dizzy or any other difficulty while doing yoga, you should perform savasana or makarasana to give rest to the body.
- While doing yoga, it is the right practice to exhale while bending forward and to inhale while stretching backwards. It is better to breathe through the nose.

Do you know

20 minutes of yoga improves the efficiency of brain



An Indian researcher in Illinois University, Neha Gothe claims that a 20-minute yoga practice can instantly improve the functioning of the brain. She came to know the benefits of yoga



from the comparative studies conducted on 30 girls who practised yoga and aerobics. Even a 20-minute yoga practice can improve the memory and emotional stability of an individual.

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. 2.5)

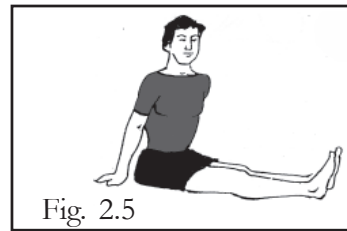


Fig. 2.5

Toe Bending

Stretch the feet forward and backward by keeping the toes together. (Repeat 5 to 10 times). (Fig. 2.6)

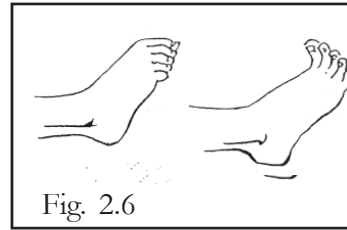


Fig. 2.6

Ankle Bending

Keep the feet together and stretch forward and backward (Repeat 5 to 10 times). (Fig. 2.7)

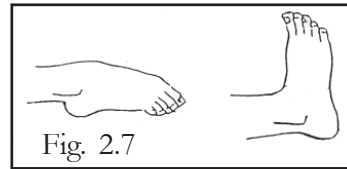


Fig. 2.7

Ankle Rotation

Keep both legs at a certain distance, first rotate the right foot clockwise (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. 2.8)

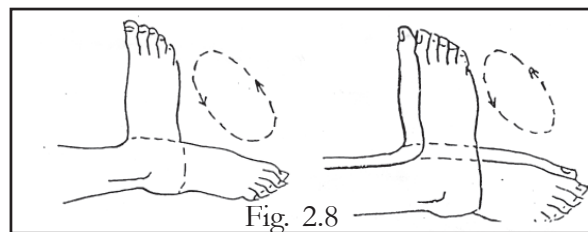


Fig. 2.8

Knee Bending

Bend and straighten the knees as shown in the picture (Fig. 2.9). Keep the hands under the knees and repeat the same on the other leg. (Do this for 5 to 10 times).

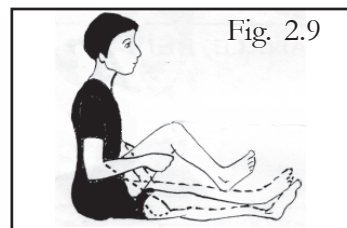
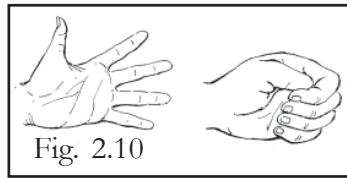


Fig. 2.9

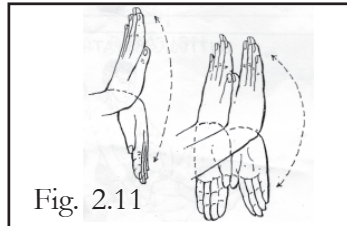
Hand Clenching

Clench and stretch your fingers for 5 – 10 times.
(Fig. 2.10)



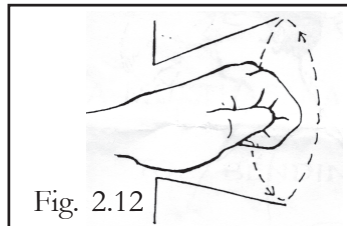
Wrist Bending

Move your wrist up and down as shown in the picture. (Do it 5 – 10 times). (Fig. 2.11)



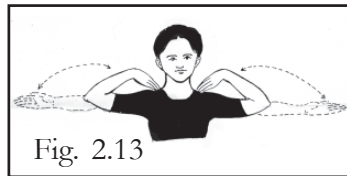
Wrist Rotation

Rotate your wrist to the right and the left. (Repeat 5 – 10 times). (Fig. 2.12)



Elbow Bending

Extend and fold both your arms to sides.
(Do this 5 – 10 times). (Fig. 2.13)



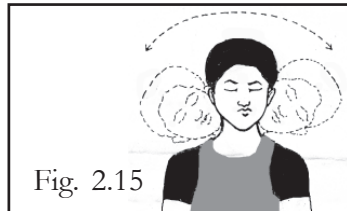
Neck up and down

Close your eyes and slowly bend head up and down. (Do this for 3 to 5 times). (Fig. 2.14)



Neck side to side

Move your head to both sides slowly and steadily for 3 to 5 times, as shown in Fig. 2.15.



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

1. Padhahasthasan
2. Pavanamukhtasan
3. Dhanurasan
4. Chakrasan
5. Sarvangasan

Activity 8

1. Padhahasthasan

Stand straight, lift your hands steadily upward and bend the hip forward and try to touch the feet. Do not bend your knees. Bring the head near the legs and slowly move to the initial position. (Fig. 2.16)

Benefits

- Enhances the position of vertebrae and legs.

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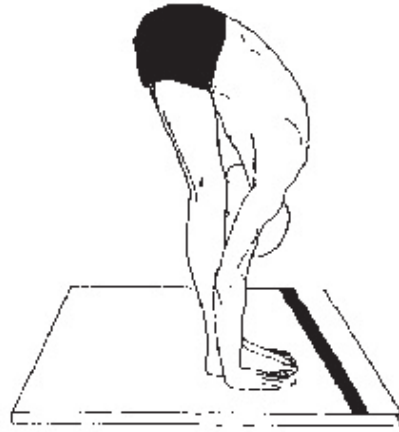


Fig. 2.16

Activity 9

2. Pavanamukthasan

Lie down on your back. Keep your legs close. Lift the legs slowly, and bring them close to the chest by holding the legs together with hands. Along with that, raise your head up and touch the forehead with the knees. Slowly return to the initial position. (Fig. 2.17)



Fig. 2.17

Benefits

- It helps in solving the problems related to acidity, digestion and constipation.
-
-

Activity 10

3. Dhanurasan

Lie prone, keep the body straight and hands close to the body. Hold the ankle, try to lift the legs using hands. Simultaneously lift the upper body and assume a bow-like position. The body weight should concentrate around the abdomen. (Fig. 2.18)

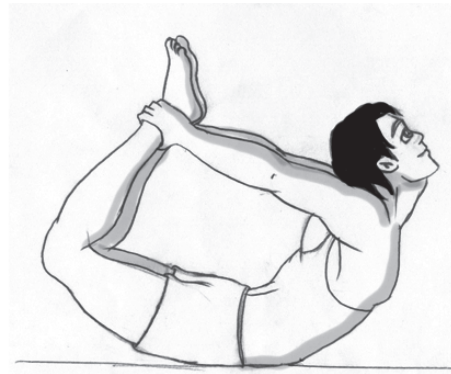


Fig. 2.18

Benefits

- Helps in removing the fat that settles around the abdomen.
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Activity 11

4. Chakrasan

Lie down on your back. Bend the knee, place the palm behind the shoulder and slowly lift the hips to resemble a wheel as in the figure. After a specified time slowly return to initial position. Those doing this for the first time should seek the help of a helper. Engage in it with due care. (Fig. 2.19)

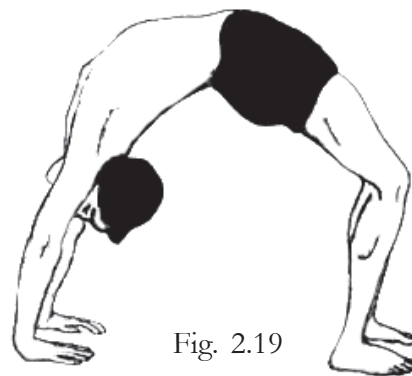


Fig. 2.19

Benefits

- Helps in strengthening liver, pancreas and kidney.
-
-

Activity 12

5. Sarvangasan

Lie down on the back keeping legs close. Place the hands close to the body. Lift the legs slowly up without bending the knees. (Fig. 2.20). Bring the legs to the initial position to complete the asana.



Fig. 2.20

Benefits

- Helps to improve digestion.
-
-

Activity 13

My Experience

Write the experiences you came across while practising the above asanas.

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Health - Physical Fitness

Remedial measures

You might have identified your basic physical efficiency from your Physical Fitness Test. Basic fitness components like cardio-respiratory endurance, muscular strength, flexibility, agility are all essential to lead a healthy life. Health related physical fitness is necessary for an individual to lead a healthy life. Proper exercise is necessary to raise and maintain the fitness components found deficient in the test. Specific exercise should be done to maintain the efficiency of each component. The changes in the body will be in proportion to the load, intensity, duration and frequency of exercises. The continuation of these exercises from school classes onwards will help to make them a part of your life style and helps to develop a new physical culture. Let's develop a new generation with health and energy.

Activity 14

Exercises to develop body flexibility

1. Stretch your body, hands and legs as shown in Fig. 2.21. Hold the stretch for 5 seconds and return to the normal position.



Fig. 2.21

2. Do the exercise with both legs as shown in Fig. 2.22. Hold the position for 10 seconds each time and go back to the initial position.



Fig. 2.22

3. Press your hands down while doing exercise as shown in Fig. 2.23. Hold for 10 seconds and return to the normal position.



Fig. 2.23

4. Tilt your neck to sides and down very gently as shown in Fig. 2.24. Hold the stretch each time for 5 seconds and return. Don't rotate your neck.



Fig. 2.24

5. Stretch one hand backward with the other hand as shown in Fig. 2.25. Hold it for 10 seconds and repeat with the other hand.



Fig. 2.25

6. As shown in Fig. 2.26, stretch the opposite leg with hand to bring it close to the buttocks. Hold it for 10 seconds. Repeat on the other leg too.



Fig. 2.26

7. Sit down. Bend forward to touch the legs as shown in Fig. 2.27. Bend till stretch is felt on the posterior of the thighs. Hold it for 10 seconds and repeat on the other leg too.



Fig. 2.27

8. Press forward the knee of flexed leg until the back is stretched as shown in Fig. 2.28. Hold it for 10 seconds and return to the initial position.
9. While doing exercise as in Fig. 2.29, ensure stretch on the muscles on the back of the knee. Hold it for 10 seconds and return to the normal position.



Fig. 2.28



Fig. 2.29

Activity 15

List out the basic qualities that were gained through exercises.

- Flexibility
-
-
-
-
-

Activity 16

Exercises to develop abdominal muscles fitness

Through sit up test, we examine the strength and endurance of abdominal muscles. Rarely do we find a person who would not have experienced lower back pain at least once in his life. Lack of abdominal muscle strength and weakness of the muscles around the lower vertebrae could be the major cause for back pain. The weight of your body and the weight of the things that you lift are borne by abdominal muscles. The exercises described below help to develop and sustain abdominal fitness.

Activity - I

Lifted leg crunch

Lie down as shown in Fig. 2.30, with legs lifted perpendicular to the ground. From this position, try to lift your body from chest to head,



Fig. 2.30

approximately 10-20 cm from the ground. This activity could be repeated more than 15 times depending on the efficiency to do it.

Activity - 11

Lifted leg reverse crunch

Lie down on the ground as shown in Fig. 2.32.

Straighten your legs and lift them upwards perpendicularly. While doing so, try to raise the hip upto 5 cms from the ground (as in Fig. 2.33). This activity could be repeated more than 15 times depending on the efficiency to do it.



Fig. 2.32

List out the benefits gained after doing the abdominal muscle exercises.

- Abdominal strength
-
-
-
-
-
-



Fig. 2.31



Fig. 2.33

Activity 17

Walking

What are the merits of walking?

- Improves cardio-respiratory efficiency
-
-
-
-
-



Activity 18

Swimming

What are the benefits of swimming?

- Improves cardio-respiratory efficiency
-
-
-



Activity - 19

Cycling

What are the benefits of cycling?

- Improves cardio-respiratory efficiency
-
-
-
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Assessment

1. Explain the different methods to minimize psycho-physical stress.
2. Write some exercises to improve health related physical fitness.
3. Describe how yoga practice improves psycho-physical efficiency.



3

Healthy Habits

Learning Outcome

- Identifies the unhealthy practices prevalent in the society and recognise the need to stay away from them.

Human beings undergo changes with change in time. Or else, they try to bring about a change by themselves. The development in the field of electronics has influenced us tremendously. Television, computer and mobile phone could drastically change our life style. These gadgets not only helped men but also affected adversely. Man who used to live in harmony with nature and society has now confined himself to these three media. Bad habits like smoking and drinking have also increased. The habit of engaging in physical activities has gradually came down and increase in the unhealthy practices has adversely affected their performance. These bad habits are responsible for most of the accidents and crimes that happen nowadays.

This lesson deals with the evil effects of the new generation social media especially mobile phones and computers and also explains the ways and means by which we can reduce their ill-effects. It also describes the need for restraining oneself from bad habits like smoking and drinking.

Activity 1

Let's conduct an experiment to understand the evil effects of smoking. Special care should be taken to see that children stay at a safe distance while conducting this experiment.

Make a hole near the bottom of a plastic bottle. Fix a small plastic tube in the hole (the tube of a pen can be used). Close the tube. Pierce the lid of the bottle and fix a cigarette through the hole. You can use clay or maida flour to seal the edges of the hole and the lid to make it airtight. Fill the bottle with water and

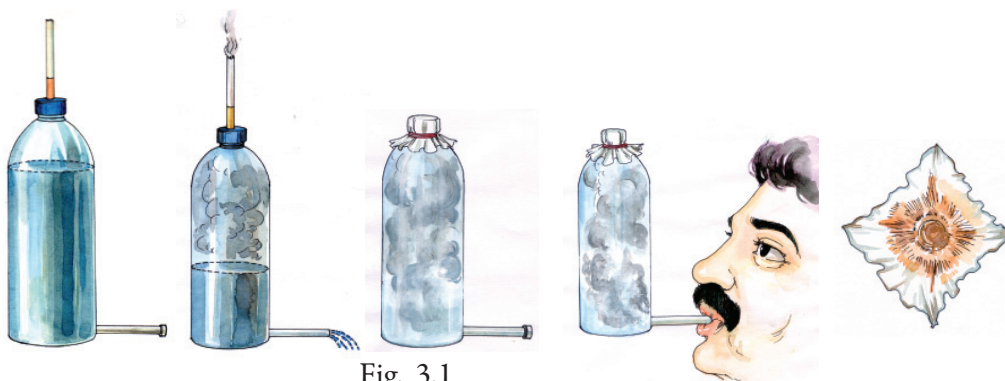
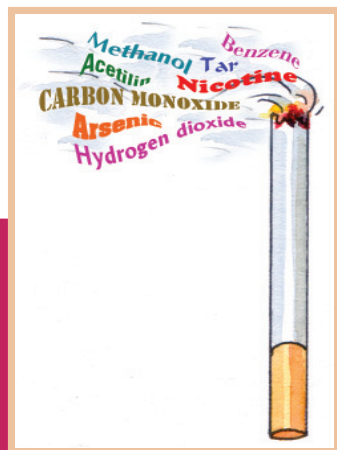


Fig. 3.1

close it with the lid having the cigarette. Light the cigarette and open the tube at the bottom, allowing the water to drain out. You can see that as the water level falls, the cigarette burns and the smoke fills inside the bottle. After the water is fully drained, close the tube again. Open the lid and place a tissue paper or filter paper over the bottle. Now tighten the lid using a rubber band. Open the bottom tube and blow forcefully through it. Smoke goes out through the tissue paper. After sometime, if we open the lid, we can see some particles. These are poisonous substances like tar and nicotine.

About 4000 chemical substances are present in tobacco smoke. Of them 400 are poisonous and 69 cause different types of cancer.



Activity 2

You might have understood about the poisonous substances emitted while people smoke. Prepare a note about the health problems caused by smoking.

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According to the statistical data of the World Health Organization, sixty lakhs of people die of tobacco usage every year. Of these, six lakh people do not smoke directly; they only inhale the smoke emitted by others who smoke.

Activity 3

Hints

1. Smoking destroys the elasticity of human blood vessels and makes them shrunken and narrow.
2. When a person smokes, the carbon monoxide present in it gets mixed with the haemoglobin in the blood. The capacity of the haemoglobin to carry oxygen is reduced considerably.
3. The substance called nicotine present in the tobacco causes contraction of the arteries and the respiratory tract.

You have read the hints given above haven't you? Based on these hints, discuss and prepare a note on how smoking affects physical activities.

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Activity 4

Balance Walk

Let's play a game. Make a student stand in a circle with a diameter of one metre. Ask the student to rotate himself and draw ten circles around him on the ground using a small stick. After drawing the circles, the student should stand erect and walk through the broad adjacent path of 1m breadth and 10m length drawn in front of the circle. The child will be considered as failed if he touches the line or falls while walking. Once the student passes the 10m long line, he is declared the winner. All the students get the same opportunity. There is a possibility of students losing their balance and falling down. So the teacher and the other students should be careful while the play is on.



Fig. 3.2

Activity 5

Describe your experience on Balance Walk.

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You have performed some unusual movements in the game, Balance Walk (circling using a stick). These unusual movements may have affected your senses and would have prevented your body's usual movements. Likewise, alcohol destroys the stability of human senses. The damages caused by alcohol to the different organs of our body are given from columns A to M. The picture of different organs are also given alongside. Match the columns with the organs in the picture.

Activity 6

- A. Pharynx: In an alcoholic who is a smoker too the possibility of pharyngeal cancer is ten times greater than that in others.
- B. Lungs: Due to the decreased resistance power, the possibility of diseases like pneumonia, tuberculosis etc. is increased.
- C. Heart: Results in a condition called cardiomyopathy which damages the heart muscles.
- D. Liver: Unusual enlargement of the liver together with Cirrhosis, which is a fatal disease.
- E. Bone: Severe alcoholism results in the decay of bones (osteoporosis).
- F. Pancreas: Results in Pancreatitis, a disease condition.
- G. Testis: Weakens the male gland.
- H. Eye: Reduces the efficiency of the muscles that help eye movements.

- I. **Brain:** Fatal diseases that affect the brain, loss of memory, learning disability, etc.
- J. **Stomach:** Causes ulcer and other diseases that affect the stomach.
- K. **Blood and bone marrow:** Difficulty in the clotting of blood and anaemia.
- L. **Nerves:** Reduces the interaction through the five senses.
- M. **Muscles:** Decreased muscle functions and painful muscle cramps.

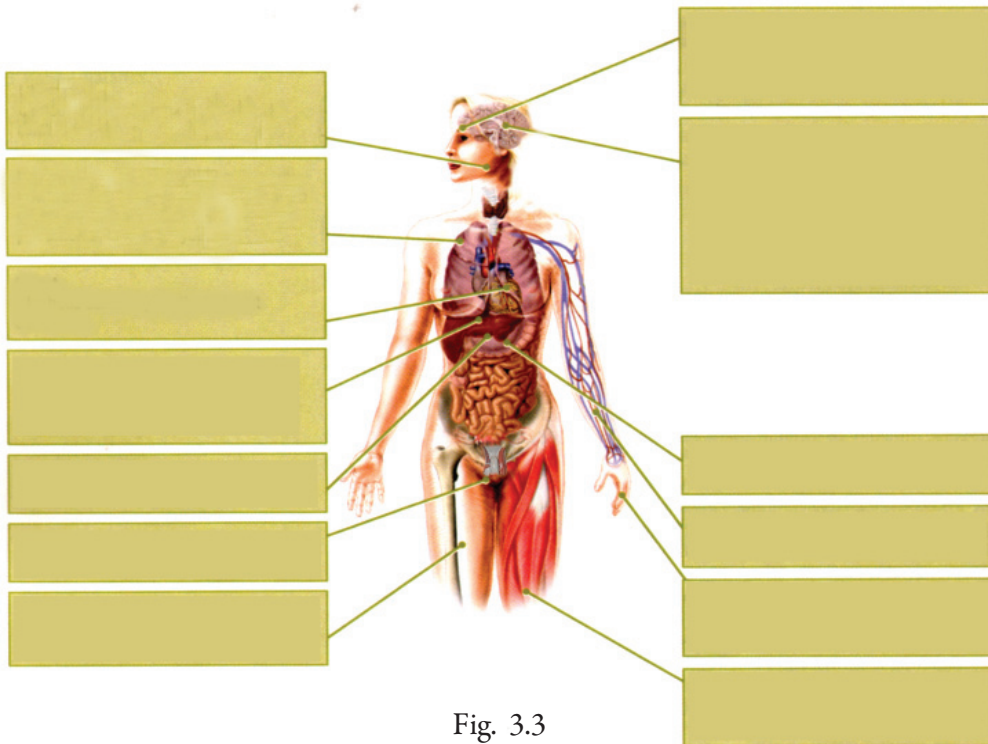


Fig. 3.3

You might have seen drunkards who misbehave in public places and on the streets. They destroy their life and health as well as create nuisance to the society. They lag behind in all physical and mental activities.

Activity 7

Discuss and write down how alcoholism adversely affects physical activities.

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Liver helps in the dissimilation and expulsion of alcohol. When alcohol consumption increases, liver fails to dissimilate it and is hence damaged.



The wellness of a human being depends on six factors. Balanced diet and healthy body weight, regular exercise, avoidance of smoking, drinking, ability to overcome stress and regular medical check-up are those six factors.

Activity 8

Excessive use of mobile phones and computers are nowadays a common trend among the youth. It leads to many serious health issues. You might have used mobile phone and computer. Don't you feel certain



discomforts when you use these gadgets for a long time? Write down the discomforts you experience. Discuss in class and write down the problems caused by excessive use of these gadgets.

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Certain things are to be kept in mind while using computers and mobile phones.

- Ensure enough light while using them.
- Ensure the clarity of the monitors.
- Sit in such a position that our eyes are at a distance of 18 to 30 inches from the monitor.
- Sit effortlessly in a balanced position.
- Take breaks while using computers.
- Keep mobile phones 16 inches away from your eyes.
- Do not look at the mobile screens continuously for a long time. Every now and then, look at objects at a distance.
- Blink your eyes frequently.
- Reduce the volume of your phone.
- Avoid listening to music or speaking over the phone for a long time.
- Zoom the mobile screen for better visibility.
- Engage in physical activities, instead of playing in computer and mobile games.

Tension caused when you do not receive incoming calls and cannot make outgoing calls due to lack of signals is called Nomophobia.



Activity 9

Continuous use of computers and mobile phones cause excessive strain to our eyes. Let's learn some exercises for relaxing the eyes and eye muscles and to increase their efficiency.

1. Sit straight and look at the tip of your nose. Continue this for ten seconds. Close your eyes and relax for ten seconds. Repeat this exercise three times. (Fig. 3.4)
2. Focus your sight on the central point between the eye brows. Continue this activity for ten seconds. Close your eyes and relax for ten seconds. Repeat the process three times.(Fig. 3.5)
3. Sit straight and keep your right hand in front of your eyes, parallel to the floor and your shoulders, keeping your fist closed and your thumb up. Slowly move your hand towards the right. Keeping your head steady, fix your eyes on the tip of your thumb and move simultaneously. Continue the movement of the hand till the thumb disappears from your view. Bring the hand back to the original position and continue to fix your eyes on the tip of the thumb. Then close your eyes and relax. Continue the process on the left side. Repeat for three times.(Fig. 3.6)
4. Sit straight and keep your hands in front of your eyes parallel to the shoulders and the floor. Keep your fists closed and thumbs up. Slowly move the right



Fig. 3.4



Fig. 3.5



Fig. 3.6



Fig. 3.7

hand to the right side and the left hand to the left side. Keeping your head steady, try to look at the thumbs without moving the eyeballs. Continue the movement of the eyes till the thumbs go out of the sight. Bring the hands back to the original position and continue to look at the thumbs. Close your eyes and relax. Repeat the process three times. (Fig. 3.7)

5. Sit straight and keep both your hands parallel to the floor and your shoulders. Keep your fists closed and your thumbs in an upright position in front of your eyes. Bring both the hands slowly to the tip of your nose. Focus your sight at the tip of the thumbs. Bring the hands back to the original position. Close your eyes and relax for ten seconds. Repeat for three times. (Fig. 3.8)



Fig. 3.8

Activity 10

Describe your experience when you performed the above exercises.

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The best way to relieve stress is to play games. Let's learn a new game.

Activity 11



Fig. 3.9

Ball War

Let the students form two teams. Draw three parallel lines 5m apart. Place three footballs at equal distance on the middle line. The two teams should line up in a parallel fashion behind the lines on the two sides. The two teams must possess three tennis balls each. After the instruction has been given, the teams should try to move the football by striking it with the tennis ball through the opponent's line. If a team succeeds in pushing the football out through their opponent's line, they gain one point. Both teams can collect the tennis balls and throw from behind their lines. When all the three footballs have crossed the lines, they can be brought back to the middle line and the game can be continued for a stipulated time. The team that scores more points will be the winner.

Did you enjoy the game?

Do you think that this game will help in reducing stress?

Bad habits like smoking, drinking etc. and the excessive use of computers and mobile phones have become the greatest dangers of the modern world. Getting to know more about their evil effects and taking remedial steps will help us to free ourselves from these menaces.

Assessment

- Write two poisonous substances contained in tobacco.
.....
- Which chemical in the tobacco obstructs the flow of oxygen in the blood-stream?
.....
- How far from the eyes should the mobile phone be held while using it?
.....
- Alcoholism results in the deficiency of a hormone, which in turn affects the growth of muscles. Name the hormone.
.....

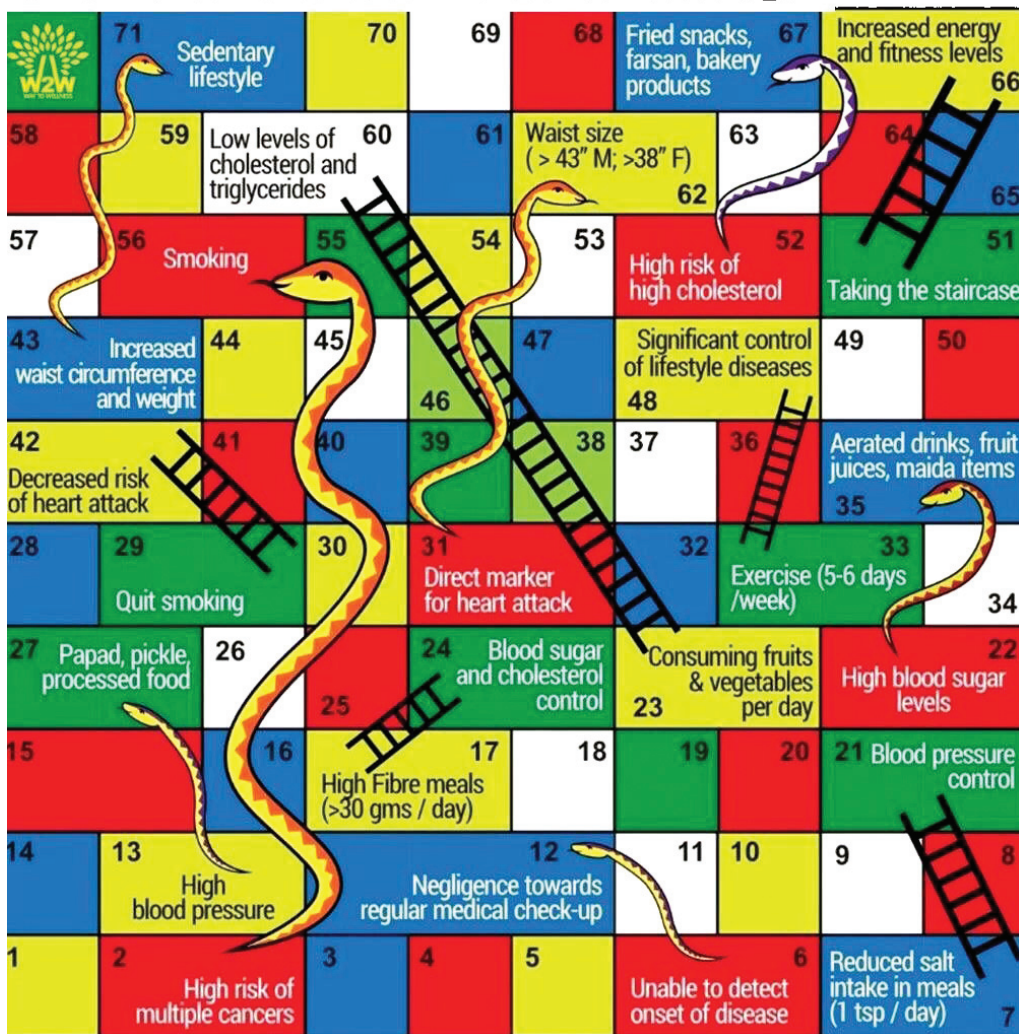
5. Understood the ill-effects of smoking and alcoholism.

Completely Partially Not at all

6. Understood the evil effects of excessive use of computers and mobile phones.

Completely Partially Not at all

MOVE UP IN LIFE WITH HEALTHY HABITS



4

A Healthy Life Style

Learning Outcomes

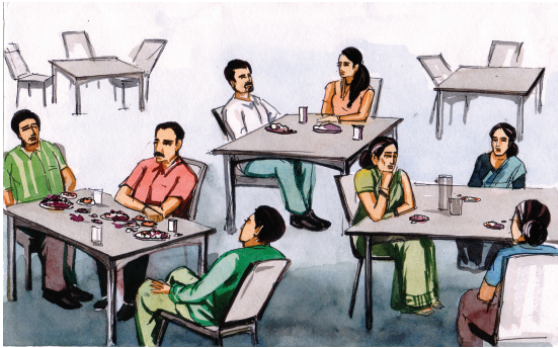
- Discovers the strength to uphold social values in life.
- Observes the importance of a healthy life style.

"Money is yours but resources belong to the society."

Jomon and Jafar are classmates. One day, during the lunch break, Jomon noticed Jafar throwing away the left over food. He told his friend that wasting and throwing away of the food is wrong. He described an experience his father had.

When Jomon's father went abroad, he had visited a restaurant along with his friends. A couple was seated at a nearby table. They had only two dishes in front of them. Jomon's father thought them to be either miserly or too poor. At another table were seated three elderly women. They ordered just one dish which the waiter brought and distributed among the three. Jomon's father watched in amazement how the ladies finished the food to the last morsel using a spoon. He and his friends ordered food and beverages from the menu a little too lavishly. Half the food was leftover even after they had finished eating. As they were about





to leave after paying the money, one of the elderly women came upto them. She strongly expressed her anger and displeasure on their wasting the food.

Hearing this, Jomon's father and his friends got enraged. They retorted that they had paid money for the food they had ordered and that it was not her business to enquire whether they had eaten the food or not. Soon one of the ladies called someone over the phone and within minutes an officer from the Social Security Department came into the restaurant. He talked to the ladies and then came to Jomon's father demanding a fine of 50 Euros. He said, "You must order only the quantity you can eat. You may be rich. But the resources belong to the society as well." Jomon's father could say nothing and lowered his head in shame.

Jomon's father and his friends realised their mistake and decided to pass this information to others.

Find out the moral of this anecdote. Share such experiences with your friends and discuss.

In addition to the values that we have learnt from this incident, there are many other values and attitudes that we need to acquire as a social being. We imbibe most of these by participating in games. Let's attain some values through games.

Activity 1

Who is missing

Keep the eyes of a student closed. Ask another student to go out of the class silently and hide. Shuffle the positions of the children sitting in the class. Now ask the first student whose eyes were closed to open his eyes and identify the student who has gone out.



After playing the game in the classroom, discuss the values that are being tested here.

Activity 2

Situational response

Write your responses to the questions given below.

1. You give Rs. 100 to the shopkeeper after purchasing a ball that costs Rs. 80/-. By mistake, the shopkeeper gives you Rs. 30/- instead of Rs 20/- as balance. What will you do?

- A. Feel happy about getting an excess of 10 rupees.
- B. Give back Rs. 5 keeping Rs. 5 with you.
- C. Return Rs. 10.



Ans :

2. You notice a student making noise when the teacher was not in the class. What will be your response if the teacher enquires as to who made the noise?

- A. Tell the teacher what you noticed.
- B. Do not respond
- C. Explain vaguely

Ans :

3. You have not understood completely what the teacher has taught. What will be your response if she asks you whether you have understood?

- A. Tell her that you have understood.
- B. Will not respond
- C. Admit that you have not understood.

Ans :

4. If you notice that drugs are being sold in a shop located near your school. What will you do?

- A. Will not tell anyone.
- B. Tell people who are responsible (teachers, parents and others)
- C. Tell other students

Ans :

5. On your way back to the classroom from the play ground, you forget to take the ball and you realise that it is lost. Later, if your teacher asks you about this, what will you say?
- Will not respond
 - Blame other students
 - Confess that you are responsible for the loss.



Ans :

6. During a cricket match, you are batting. The ball rubs against the bat and reaches the hands of the keeper. But the umpire does not notice this. The opponent team is appealing for declaring you out. What will you do?
- Wait for the umpire's decision
 - Argue that the ball did not rub against the bat.
 - Leave the crease.

Ans :

What is your score?

Activity 3

Team work

Each group is given a few pieces of paper and told to construct a letter of the English alphabet. The group that first constructs the letter using the pieces of paper becomes the winner.

Could you construct a letter? If you could, which factors helped you in the process? If you could not, why?

Activity 4

Cool Volley

Split into groups of two and start a volley ball game on a play court of 12 m length and 12 m breadth. When one group is playing, the other teams should function as the audience, officials and organisers



Figure 4.1

of the game. Start the game after collecting the details about the game from the teacher.

- In the absence of your teacher, could you play honestly, co-operating with the other players and at the same time, obeying all the rules of the game?
- Could you control the game, impartially?

Discuss with your friends and find out.

While playing, watching, controlling and organizing games, we imbibe many values in life even without our conscious knowledge or effort.



Kim Antonie Lode Clijsters was born on 8 June 1983 in Belgium. She started playing tennis at the age of six and became the national champion at the age of 15. In 1999, she made her debut in professional tennis and won the U.S. Open and her first grand slam title in 2005. While she was at the pinnacle of her career, she got married in 2007 and gave birth to a baby girl in 2008. She came back to professional tennis by winning the US Open in 2009. She also won the grand slams US Open in 2010 and the Australian Open in 2011 and was declared World Rank Number One. Later, though she retired from the game after the U.S Open in 2012, she continues to be active in the sports world by participating in exhibition matches and so on.

Note

Three of the four grand slam titles won by Clijsters were during her second spell.

Exercise has an important role in maintaining good health throughout our life. By following a healthy routine right from our childhood, we can maintain and improve our health and fitness. The life story of Kim Clijsters that we have read, is a good example for this. Even though she took a break from the game after marriage and giving birth to a child, she made a come back by becoming more active in the game and winning titles. From this we can infer that Kim

continued her healthy lifestyle and exercises even after taking the break and that must have helped her tremendously in maintaining her health and fitness.

Ageing is the condition that a person undergoes while moving through the different stages of life from birth to old age. During these stages, a person undergoes physical and mental changes. When she uses the maturity and knowledge she gathered from them, to maintain her health and proceed gracefully towards old age, we call it healthy ageing.

Conversation at the Medical Store

- Shopkeeper : How can I help you, Madam?
- Lady : I want medicines for Blood pressure, Diabetes, Back pain - all for one month. Also, sleeping pills. Please take ten tablets.
- Shopkeeper : Anything else?
- Lady : Do you have any medicine for good health?
- Shopkeeper : No, Madam.
- Lady : Ok. How much do I have to pay?
- Shopkeeper : Rs. 2190
- Lady : Here is the money.
- Shopkeeper : Sorry madam, I don't have change.
- Lady : How much is the balance?
- Shopkeeper : 10 rupees
- Lady : OK. Please give me medicine for fever for that amount. Will come handy when we have fever.



Discuss the ideas you have gathered from the above conversation.

Activity 5

When we purchase a vehicle, we try to understand its efficiency and functions. We also provide the necessary care at the right time to maintain good performance. At the same time, do we take care of our own health?

How can we take care of our health? We ought to look after our body right from childhood to old age. We should find time for our well being, depending on our age. A weekly plan for exercises can be prepared and followed. Complete the table given below.

Day	Morning 30 minutes	Evening 30 minutes
Monday		Volley ball
Tuesday	Yoga	Foot ball
Wednesday	Aerobics	Cricket
Thursday		
Friday		

Table 4.1

Activity 6

From the table given below, classify and write in separate columns the habits that should be followed for healthy ageing and those that should not be.

Habits	Advisable	Not advisable
Mental stress		
Mental happiness		
Sufficient sleep		
Rest		
Over eating		
Nutritious food		
Exercise		
Drinking alcohol		
Disciplined life style		
Over work		
Cleanliness		
Balanced diet		
Obesity		
Drug abuse		

Table 4.2

The knowledge that you have gained about the different parts of the body and their functions will definitely help you progress towards healthy ageing.

Assessment

1. Which factor is necessary for winning in the game 'Who is missing'?
 - a. Confidence
 - b. Co operation
 - c. Over eating
2. Which habit is essential for maintaining a person's health ?
 - a. Medicine
 - b. Exercise
 - c. Over eating
3. Pick the most important value of life that can be imbibed from games?
 - a. Inferiority complex
 - b. Social awareness
 - c. Non cooperation

5

Food for Physical Fitness

Learning Outcome

- Better health can be achieved through better eating habits.

The Intramural match between the Yellow House of which Adarsh was a member and the Blue House was going on. During the match, Adarsh felt a physical discomfort and sat down on the ground. Soon a substitute was called in and the match continued. But the Yellow House, which was leading by virtue of the two goals scored by Adarsh, was defeated by the Blue House with a score of 2-4. After the match, the Yellow House team assembled for a meeting to review the match and it was observed that the substitution following Adarsh's discomfort had badly affected the performance of the team. Even though the students enquired the reason for his discomfort, Adarsh did not give an answer. The students approached their teacher and she gently asked Adarsh the reason for his discomfort. She came to know that he had not taken his breakfast that morning. The teacher then spoke to the students about nutritious food and healthy diet.



Activity 1

Now, you have read the experience that Adarsh had during the match. You might have also noticed many students experiencing such physical discomfort while engaging in physical exercises. Write down how these physical problems are related to their food habits.

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Nutritious food

Human beings get the energy required for their metabolic and day-to-day activities from the food they take (consume). Each person should consume food in suitable quantity and quality depending on their physical activities and physique. The requirement of food items for a sports person is different from that of an ordinary person.

Nutritious food is the food rich in nutrients required for carrying out various activities in life smoothly. There are primarily six components contained in nutritious food. Out of these, production of energy takes place only from carbohydrates, fats and proteins. Even though minerals, vitamins and water do not produce energy, they are very essential for the various activities of the body.

1. Carbohydrates

Carbohydrates are the most important source of energy required for the body. Carbohydrates contained in the food materials get changed into a smaller component called glucose through the process of digestion, and acts as an important source of energy for the body cells. Carbohydrates are components required for short-time as well as long-time competitions. When we indulge

in physical activities for a longer duration, the carbohydrates stored up as glycogen in the liver and the muscles of the body as well as the glucose in the blood get consumed for producing energy. When the level of glucose in the blood comes down, we experience fatigue. For those who indulge in physically strenuous activities for longer time need about 8 to 10 gms of carbohydrates for 1 kg of body weight. Those who take part in activities that require more speed and muscle power should consume 5 to 6 gms of carbohydrates for 1 kg of body weight.

2. Proteins

Proteins are used primarily for the building up of body cells. Our body gets proteins from cereals, meat, fish, milk and other food materials. In sports, more protein-rich food materials are included in the diet of athletes who compete in weight lifting, wrestling, shotput and other such events that need more muscle power and muscle mass. For an adult, the protein requirement is 0.8 gms for 1 kg of body weight and for people who indulge in long duration physical exercises and those who undergo intense weight training, it is approximately 1.4 gms and 1.7 gms respectively.

3. Fats

Fat is mostly used for producing energy. It contains almost double the amount of energy contained in Carbohydrates and Proteins. Fat is obtained primarily from ghee and butter. With increasing duration of the physical activity the energy released from the fat also increases. For people who indulge in physical activities, 20% to 35% of the energy should be supplied by the fat contained in the food. When the fat content of the food goes below the required level, it results in a decrease in the production of testosterone hormone which in turn, adversely affects muscle growth.

4. Vitamins

Vitamins help and control life activities. Some vitamins are produced by the body itself. The remaining should be acquired from the food that we take. In

order to produce energy from food, the presence of certain vitamins like thiamine, riboflavin, niacin etc. is essential. Certain vitamins are indispensable for physical activities.

5. Minerals

Like vitamins, minerals are also nutrient constituents that help and control life activities. Calcium, Potassium, Sodium, Phosphorus, Iron, Iodine etc. are some of the important minerals. Deficiency of minerals will adversely affect the physical functions. For example, deficiency of Sodium and Potassium may adversely affect muscular movements.

6. Water

Maintaining a balance in the state of water in the human body is essential to carry out the various activities of the body in a smooth manner. While engaging in physical activities, a great amount of water is lost as sweat and this should be compensated by water intake at the right time.

Drinking water half an hour before food helps in digestion.

Drinking two glasses of water in the morning immediately after getting up increases the efficiency of the internal organs.



Activity 2

Some sports events are given in Column A. Nutrient required for the competitors taking part in each event is to be included in Column B and its source in Column C. Complete the table suitably.





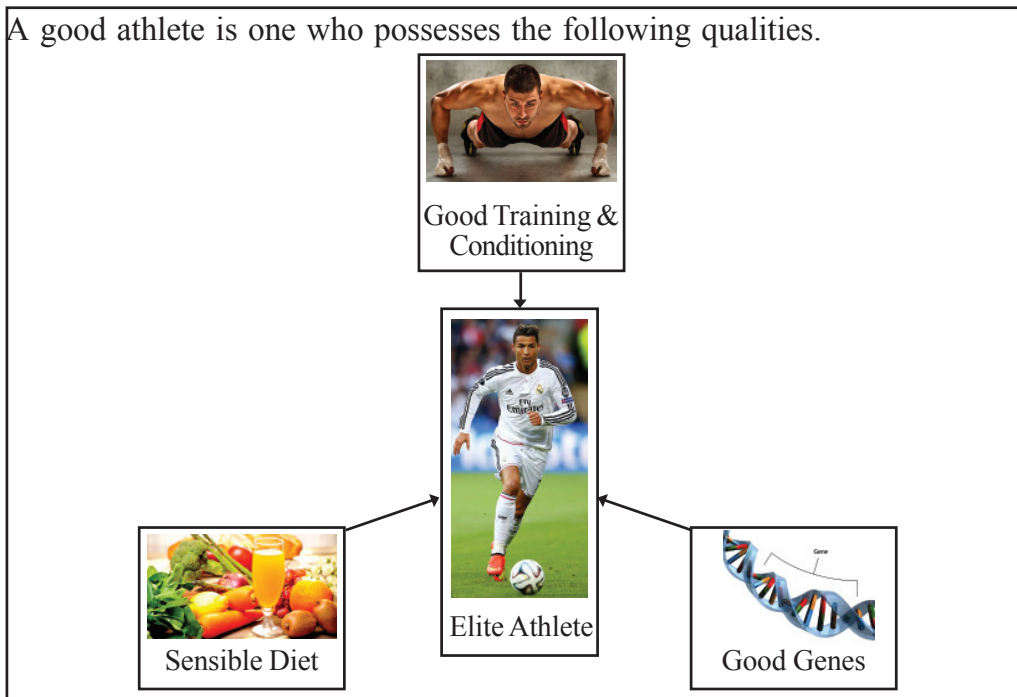
A Sport event	B Nutrient	C Source
Marathon 	1. 2. 3.	
Power lifting 	1. 2. 3.	
Hammer throw 	1. 2. 3.	
Basketball 	1. 2. 3.	

Table 5.1

A good athlete is one who possesses the following qualities.



Activity 3

Quiz Circle

Draw a circle on the ground and mark it as A. Draw six big circles at a distance of 10 meters from A. Name them as Carbohydrates, Proteins, Fats, Vitamins, Minerals and Water. Divide the

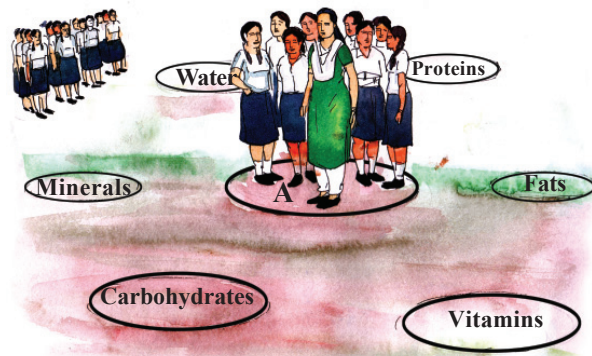


Fig. 5.1

class into four teams having equal number of students. Two members of each team, a total of eight members should stand along with the quiz master in the circle A. When the quiz master poses a question, the eight members should move to any one of the six circles. This circle should be the answer to the question. For each correct move, they will get one point. Once they enter a circle they are not allowed to come out of it. In this manner the next set of members of the other teams should join the quiz master for their question. The game continues and after ten questions, the team which gets more points becomes the winner.

Dehydration

The water we drink and the water formed during the process of digestion are the main sources of water in our body. Seventy percent of our body weight is water. Water has an important role in maintaining the temperature of the body as well as in the discharge of waste materials from the body. Water is expelled from the body in the form of sweat, urine and faeces.

Dehydration is the condition in which the water content in the body goes below the normal level.

The rate of dehydration will be greater in athletes participating in events that last for a longer duration of time. This affects their physical and mental well-being in an adverse manner. Dehydration results in loss of body weight. It also adversely affects their response mechanism, concentration, decision making ability and the ability to gauge the competition situation properly.

Activity 4

Complete the following table after discussing the reasons and symptoms of dehydration.

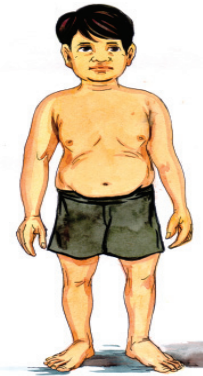
Reasons	Symptoms
•	•
•	•
•	•
•	•

Table 5.2

Precautions

Acute dehydration can even lead to death. In the case of dehydration, intake of water added with salt and sugar and juices of fruits is advisable. A sports person can prevent dehydration by drinking water during intervals and after the events.

Obesity



We know that the energy we need for life activities and physical activities is obtained from the food that we intake. When we take too much food and have very little physical exercise, the excess food gets stored up in the body in the form of fat. This condition of excess fat deposit in the body is termed as obesity.

A table depicting the quantity of fat content in the body is given below. From the table we can understand the recommended as well as the excess percentage of fat in the body.

The most acceptable and accurate method of finding the quantity of fat in the body according to Archimedes principle is Under Water Weighing or Hydrostatic Weighing.



Sex	Age	Underweight Fat%	Normal weight Fat %	Obesity Fat %
Man	20 - 40	7	7 - 20	above 20
	above 40	10	10 - 25	above 25
Woman	20 - 40	19	19 - 40	above 40
	above 40	22	22 - 36	above 36

Table 5.3

Activity 5

We have learnt about underweight and obesity. Discuss and write down the reasons and solutions for them.

Condition	Reasons	Solutions
Obesity	<ul style="list-style-type: none"> • • • • 	<ul style="list-style-type: none"> • • • •
Underweight	<ul style="list-style-type: none"> • • • • 	<ul style="list-style-type: none"> • • • •

Table 5.4

Body Mass Index (BMI)

You know what body mass index is and how is it determined, don't you? This is a method to find out whether our body weight is proportionate to our height. A table of Body Mass Index (BMI) is given below. Examine the table and find out your BMI and the condition of your body.

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height} \times \text{Height (m)}}$$

	Condition	Boys	Girls	Adult
BMI	Under weight	less than 17.01	less than 16.37	less than 18.5
	Normal weight	17.01 - 24.45	16.37 - 24.74	18.5 - 24.9
	Above normal weight	24.46 - 28.53	24.75 - 29.1	25 - 29.9
	Obesity	above 28.53	above 29.1	above 29.9

Source : WHO/ICMR

Table 5.5

Energy requirement on a daily basis

The amount of energy required for a person for his day-to-day activities depends on a number of factors. They are age, general health, sex, weight, climate, heredity, lifestyle and physical activities. For one kilogram of body weight, about 1.3 kilo calories of energy is required per hour. This may vary depending on the fat content in the body. For a person engaging in physical activities, about 8.5 kilo calories of energy is required per kilogram of weight for an hour. This can vary according to the nature of the physical activity and the strain involved.

The quantity of energy required for a person for his daily activities is calculated as follows: Energy required for one day + Energy for excessive physical activities = Total energy spent.

Activity 6

Based on the above details, find out the energy required for one day's activities for a child weighing 40 kg as well as the excess energy required for the same person for two hours who engages in physical exercises.

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Assessment

Answer the following questions

1. What are the components of nutritious food?

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.....

2. Which is the most important nutrient that helps in the growth of the body?

.....

3. In which form is Carbohydrate stored in the liver and muscles?

.....

Tick (✓) the knowledge that you gained from this unit.

Could gather knowledge about nutritious food	Yes	No
Understood the importance of nutritious food in physical activities	Yes	No
Recognized the reasons for dehydration and obesity	Yes	No

