

Class X - Health and Physical Education

**Effects of Physical Activities on Human Body**

# CBSE NOTES

## **Effects of Physical Activities on Human Body - Practice Worksheet**

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# Practice Questions

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## 1. Explain the short-term and long-term effects of physical activities on the muscular system.

*Hint: Consider the changes in muscle fibres and the role of oxygen in muscle performance.*

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**Solution:** Physical activities have both short-term and long-term effects on the muscular system. In the short term, physical activities lead to muscle contraction, which uses up energy and increases muscle temperature. This can result in immediate muscle fatigue due to the accumulation of lactic acid when oxygen supply is insufficient. In the long term, regular physical activities cause muscle fibres to enlarge, leading to an overall increase in muscle size and strength. This is due to the increase in muscle proteins like actin and myosin. Regular exercise also improves muscle tone, increases the number of blood capillaries supplying the muscles, and enhances the efficiency of ligaments and tendons. Additionally, it delays muscle fatigue by improving oxygen supply and increases the capacity for storing food in muscle cells for energy. Examples include the well-developed arm muscles of a tennis player and the endurance of a marathon runner.

## 2. Describe how physical activities affect the respiratory system.

*Hint: Focus on the changes in lung capacity and the role of exercises like Pranayam.*

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**Solution:** Physical activities significantly impact the respiratory system by increasing the demand for oxygen. In the short term, this leads to an increased respiratory rate and depth of breathing to meet the oxygen demand and remove carbon dioxide. Over time, regular physical activities increase the size of the lungs and the volume of the chest, enhancing lung capacity. This is accompanied by the strengthening of the diaphragm and rib muscles. Practices like Pranayam and Anulom-vilom improve lung power and the efficiency of alveoli. Regular exercise also activates previously inactive alveoli, increasing the residual volume of air, tidal air, and vital capacity. For instance, an athlete's vital capacity can increase up to 5500cc, compared to the normal 3500cc to 4500cc in adults, demonstrating improved respiratory efficiency.

## 3. What are the effects of regular physical activities on the circulatory system?

*Hint: Consider the changes in heart structure and function, and the impact on cholesterol levels.*

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**Solution:** Regular physical activities have profound effects on the circulatory system. They increase the size and thickness of the heart's walls, enhancing its pumping efficiency. This leads to

a decrease in resting heart rate, as seen in athletes, whose hearts can pump more blood with fewer beats. Stroke volume, the amount of blood pumped per beat, also increases. Physical activities increase the number of active capillaries and blood cells, improving circulation and oxygen delivery to tissues. They also influence cholesterol levels by increasing HDL (good cholesterol) and decreasing LDL (bad cholesterol), reducing the risk of heart diseases. For example, a regular runner will have a more efficient circulatory system, with a lower resting heart rate and higher stroke volume, compared to a sedentary individual.

#### 4. How does yoga contribute to the improvement of the muscular, respiratory, and circulatory systems?

*Hint: Think about the specific yoga practices and their targeted effects on each system.*

**Solution:** Yoga contributes to the improvement of the muscular, respiratory, and circulatory systems through various asanas and practices. For the muscular system, yoga asanas develop and strengthen muscles, particularly in the chest, abdomen, and lungs, enhancing muscle tone and flexibility. In the respiratory system, practices like Pranayam improve lung capacity and efficiency by strengthening the muscles involved in breathing and increasing the activity of alveoli. For the circulatory system, yoga enhances blood circulation and heart efficiency, reducing the risk of heart diseases. Suryanamaskar, a sequence of yoga poses, is particularly effective in improving blood circulation and lung strength. Regular yoga practice also helps in maintaining correct posture and preventing postural deformities, contributing to overall physical fitness and health.

#### 5. Explain the concept of oxygen debt and its relevance to physical activities.

*Hint: Consider the balance between oxygen demand and supply during exercise.*

**Solution:** Oxygen debt occurs during intense physical activities when the body's oxygen demand exceeds the oxygen supply, leading to anaerobic respiration and the accumulation of lactic acid in muscles. This creates a temporary oxygen deficit that needs to be repaid during the recovery period after the activity. During this time, the body breathes more deeply and rapidly to take in additional oxygen to oxidize the accumulated lactic acid and restore energy reserves. For example, a sprinter may experience oxygen debt after a race, requiring a recovery period to normalize breathing and eliminate lactic acid. Understanding oxygen debt is crucial for athletes to manage their performance and recovery effectively, ensuring they can sustain high levels of physical activity without excessive fatigue.

#### 6. Discuss the role of physical activities in maintaining mental and emotional health, especially during the COVID-19 pandemic.

*Hint: Focus on the psychological benefits of exercise and its importance during the pandemic.*

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**Solution:** Physical activities play a vital role in maintaining mental and emotional health by reducing stress, anxiety, and depression. During the COVID-19 pandemic, with increased isolation and uncertainty, regular physical exercise has been essential for mental well-being. Exercise stimulates the release of endorphins, the body's natural mood lifters, promoting a sense of happiness and relaxation. It also improves sleep quality, boosts self-esteem, and provides a sense of accomplishment. Activities like yoga and meditation further enhance emotional stability by fostering mindfulness and reducing stress levels. For instance, individuals who engaged in daily walks or home workouts during lockdowns reported better mental health compared to those who were sedentary. Thus, physical activities are a powerful tool for maintaining mental and emotional health, especially in challenging times.

## 7. What are the benefits of regular physical activities on bone health?

*Hint: Consider the impact of exercise on bone density and the prevention of osteoporosis.*

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**Solution:** Regular physical activities, especially weight-bearing exercises, are crucial for maintaining and improving bone health. They stimulate bone formation and increase bone density, reducing the risk of osteoporosis and fractures. Physical activities place stress on bones, which encourages the deposition of calcium and other minerals, making bones stronger. For example, activities like walking, running, and resistance training are particularly effective in preserving bone mass. Additionally, physical activities improve joint flexibility and muscle strength, which support and protect bones from injuries. Regular exercise also enhances balance and coordination, reducing the likelihood of falls, especially in older adults. Thus, incorporating weight-bearing and muscle-strengthening activities into daily routines is essential for lifelong bone health.

## 8. How do physical activities influence the digestive system?

*Hint: Think about the relationship between exercise, metabolism, and digestive efficiency.*

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**Solution:** Physical activities positively influence the digestive system by enhancing metabolism and promoting efficient digestion. Exercise increases blood flow to the digestive organs, improving their function and speeding up the digestion process. It also helps in regulating bowel movements, reducing the risk of constipation and other digestive disorders. Regular physical activities can prevent obesity, which is a risk factor for many digestive issues, by maintaining a healthy weight. For example, a brisk walk after meals can aid in digestion and prevent bloating. Additionally, exercise reduces stress, which is known to negatively impact digestive health. Thus, incorporating moderate physical activities into daily life can significantly improve digestive efficiency and overall gut health.

## 9. Describe the changes in the heart due to regular physical activities.

*Hint: Focus on the structural and functional adaptations of the heart due to exercise.*

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**Solution:** Regular physical activities lead to several beneficial changes in the heart. The heart muscle becomes stronger and thicker, increasing its efficiency in pumping blood. This results in a lower resting heart rate, as the heart can pump more blood with each beat, reducing the number of beats needed at rest. The stroke volume, or the amount of blood ejected per beat, also increases. Additionally, regular exercise improves the heart's ability to adapt to varying demands, enhancing overall cardiovascular health. For example, an athlete's heart may have a resting rate of 50 beats per minute, compared to the average 72 beats per minute, demonstrating improved efficiency. These changes reduce the risk of heart diseases and improve longevity and quality of life.

## 10. Explain the importance of physical activities in preventing lifestyle diseases.

*Hint: Consider the role of exercise in weight management, metabolic health, and disease prevention.*

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**Solution:** Physical activities are essential in preventing lifestyle diseases such as obesity, diabetes, hypertension, and cardiovascular diseases. Regular exercise helps maintain a healthy weight by burning excess calories and improving metabolism. It enhances insulin sensitivity, reducing the risk of type 2 diabetes. Physical activities also lower blood pressure and improve cholesterol levels by increasing HDL and decreasing LDL, thus preventing hypertension and atherosclerosis. Additionally, exercise strengthens the immune system, reducing the susceptibility to infections and chronic diseases. For example, individuals who engage in at least 30 minutes of moderate exercise daily have a significantly lower risk of developing lifestyle-related conditions. Therefore, incorporating regular physical activities into daily routines is a proactive approach to preventing lifestyle diseases and promoting overall health.

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