HEALTH & PHYSICAL EDUCATION

WORKSHEET

GRADE 11

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ZONAL EDUCATION OFFICE ~ KALMUNAI

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01 Let us build a healthy society

01. What are the main objectives of the School health programmes in Sri Lanka?

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02. Write The school health promotion programmes.

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03. Write the definition of health promotion according to the World Health Organization (WHO)?

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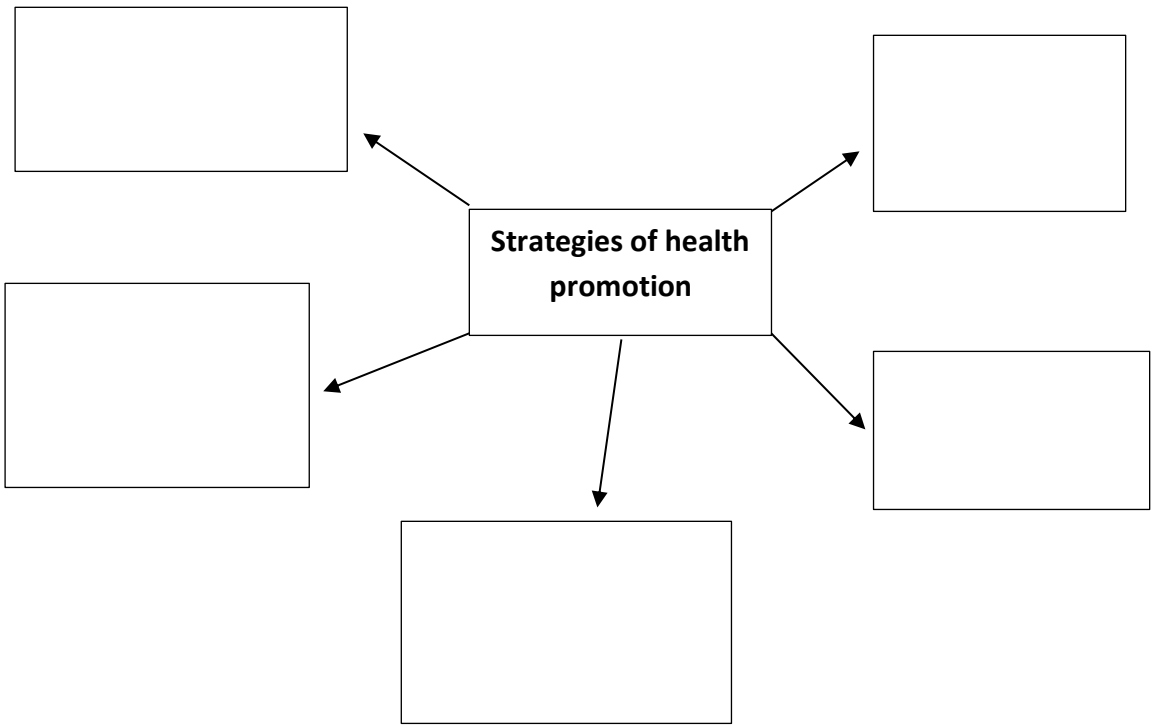
04. Write the Strategies of Health promotion.



05. Write the Centres of health promotion?

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06. Write the Actions to develop school health promotion?

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07. Write the factors that should be considered when Formulating of health promotion Policies?

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08. Write Some school health promotion policies?

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09. Write some environments that should be impacted on health promotion?

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10. Write some qualities favourable for physical environment?

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11. Write some qualities favourable for Mental environment?

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12. Write some qualities favourable for Social environment?

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13. Write some steps for Community participation in health promotion?

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14. Write some skills required for health promotion?

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15. Write some actions for developing skills required for health promotions?

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16. What are the services Provision of required services for health promotion?

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17. Write some Criteria for school health promotion evaluation?

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18. Mention some Laws pertaining to school health promotion in Sri Lanka?

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- **Facts regarding provision of health facilities**
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19. What you meant by Quality of life?

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20. Write some Factors that affect the quality of life?

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21. What you meant by total health?

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22. Write some Features of a community with a high quality of life?

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23. Write some Criteria used to measure an individual's health status?

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02 Let us identify stages in life after childhood

01. Write the stages in childhood.

02. Write the stages after childhood.

Adolescence

03. What is Adolescence?

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04. Write some Physical changes during adolescence?

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05. Write some Mental changes during adolescence?

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06. Write some Social changes during adolescence?

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07. Write the Needs during adolescence?

- ✓ **Physical needs**

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- ✓ **Mental needs**

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- ✓ **Social needs**

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- ✓ **Spiritual needs**

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08. Mention some Problems encountered when providing needs of adolescents?

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09. Write some Steps we can follow to make adolescence a success?

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Youth

01. What is Youth?

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02. Write the Needs of youth?

- ✓ **Physical needs**

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- ✓ **Psychological needs**

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- ✓ **Social needs**

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- ✓ **Spiritual needs**

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03. Write some Challenges and issues faced by youth?

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04. Write some Steps to overcome problems?

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Middle age

01. What is Middle age?

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02. Write the Needs during middle age?

- ✓ **Physical needs**

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- ✓ **Psychological needs**

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- ✓ **Social needs**

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- ✓ **Spiritual needs**

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03. Problems encountered during middle age

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04. Write some Ways of overcoming difficulties to lead a good middle age?

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Old age

01. What is Old age?

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02. Write Some physical changes occurring during this period?

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03. Write the Needs during old age?

- ✓ **Physical needs**

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- ✓ **Psychological needs**

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- ✓ **Social needs**

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- ✓ **Spiritual needs**

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04. Write some Issues faced when supplying needs of the elderly?

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05. Write the Ways of reducing problems of old age?

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03 Let us identify principles of biomechanics to maintain correct postures

01. What is the meaning of correct postures?

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02. What are the factors that are depending different postures from person to person?

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03. Write the types of Postures?

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04. Write the principles of biomechanics influence these postures?

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05. What is Inertia?

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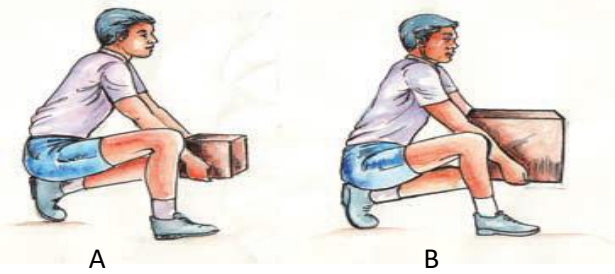
- Let us consider two objects (A and B) that have been kept on the ground for lifting. If it is more difficult to lift object B than A, inertia of the object B, or the resistance of object B to move, is higher.



- Think of a leather ball and a tennis ball that are rolling over. You will understand that it is easier to stop the tennis ball than stopping the leather ball. This means that inertia of the leather ball is higher.

06. What is Force? And explain the force with examples.

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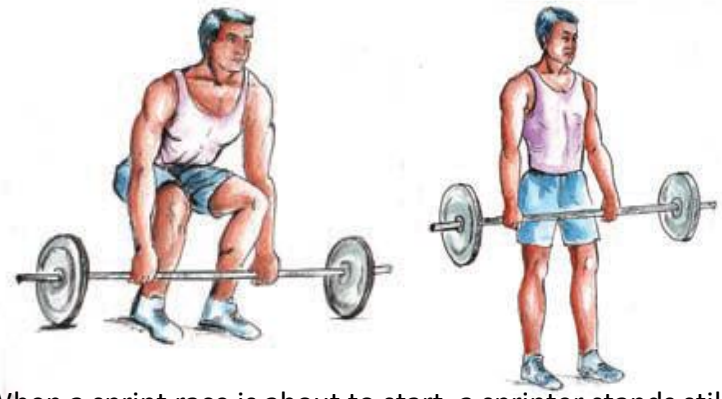
- When a weightlifter is lifting a barbell that is on his shoulders, he pushes it upwards. When the barbell that is on the ground is lifted, the weightlifter has to pull it upwards. We see such acts of pushing and pulling in different forms in sports. Actions like pulling, pushing and lifting are results of exerting force.



- When a sprint race is about to start, a sprinter stands still bracing his feet against the starting block. In order to break this stillness, the sprinter has to exert some influence. The influence that breaks the stillness is a force. The force that breaks the stillness of the sprinter is the force of the reaction that is produced as a result of the pressure exerted against the starting block by the sprinter.

- When the ball is coming towards a batsman, he hits it with his bat in order to change the direction of motion of the ball by exerting some force on it. The force necessary for a sportsman for motor activities is generated by the contraction of his muscles.
- When an athlete is throwing the shot put, he has to exert some force on it in order to make it move. Further, that force has to be exerted in the direction in which the shot put has to be thrown.
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07. What is the first law of Newton?

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08. Explain the Direction of Force.

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- ✓ A weightlifter exerts an upward force in order to lift a weight. Then that object moves in the direction in which the force is exerted.

- ✓ When an athlete jumps up, the ground exerts a force vertically upwards on the athlete because of the force that the athlete exerts on the ground. That means the force acts in the direction of the motion.

09. What is the third law of Newton?

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10. What is Momentum? Explain it.

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- ✓ When playing ˝Elle˝ it is easy for you to catch the ball that a player throws at you, but if a heavier object is thrown at you, it would be more difficult for you to catch it.
- ✓ Further, even an object that is not so heavy would be difficult to be caught when it is moving very fast.

- ✓ **Accordingly, it is clear that momentum depends on the mass and velocity of an object.**

momentum = mass x velocity

- ✓ The momentum of a shot put that is rolling over fast is greater than the one that is rolling over slowly. Further, the momentum of a bigger shot put that is rolling over at a certain speed is greater than that of a smaller one that is moving at the same speed.

- ✓ When a cricketer catches the ball coming towards him, he exerts some force on the ball with both his hands in order to stop the ball (Figure 3.5). Then the momentum of the ball becomes zero as its velocity becomes zero and consequently the ball stops moving.

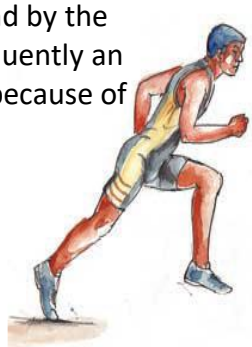
➢ Effects of principles of biomechanics on activities

Walking

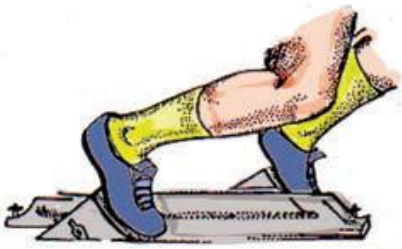
- ✓ The purpose of the activity of walking is to carry the body from one place to another. While walking, the body moves forwards or backwards and the weight of the body is shifted from foot to foot alternately. Accordingly walking is called an unceasing process in which the balance of the body is lost and regained.
- ✓ While walking, the balance of the body is maintained by moving hands and legs in opposite directions.

Running

- ✓ Running is to be pushed forwards by the force that is exerted on the ground by the feet. When running, a runner exerts some force on the ground and consequently an equal and opposite force acts on the runner. The runner moves forwards because of the reactive force that is generated.



- ✓ At the start of a 100-metre race, a sprinter remains at rest on the starting block. He exerts some force on the block using his feet. As the reactive force generated by the block in response to the athletes force, acts back on him, he is pushed forwards. If that reactive force does not act on him, he remains at rest on the block.



11. What is the second law of Newton?

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- ✓ According to this law, acceleration of an object or an athlete can be increased by increasing the force that acts upon that object or the athlete **(a higher rate of velocity change).**
- ✓ The acceleration produced when a sprinter of a 100-metre race takes off at starting block is directly proportional to the force that he exerts on the block. If the force he exerts on the block is greater, the acceleration of taking off the block is greater, too.

Jumping and throwing

- ✓ Releasing an object to the air by throwing or shooting forward, is called a **projection** and the object that is projected is called the **projectile.**
- ✓ In sports and in physical education activities, there are various events in which objects are thrown forwards.

eg: javelin, shot put, discus

- ✓ Moreover, various pieces of sports equipment are thrown forwards using various techniques.

eg: hitting the ball, kicking the ball

- ✓ In events like long jump, high jump, triple jump and hurdles, the body of the athlete becomes the projectile.

12. What is trajectory?

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- ✓ **The following figure shows the path of the centre of gravity of a long-jumper from the time he takes off until he lands.**

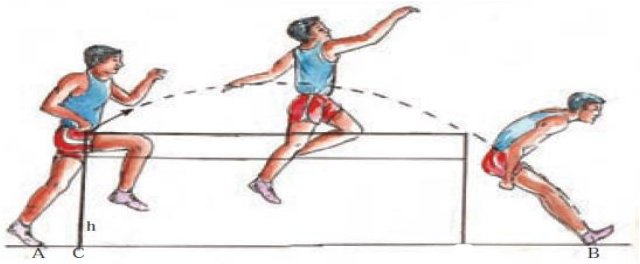

Figure 3.9

C	=	Point of taking off
B	=	Landing point
A-B	=	Distance of the jump
h	=	Take-off height

13. Factors affecting the distance or the height of the jump of an athlete?

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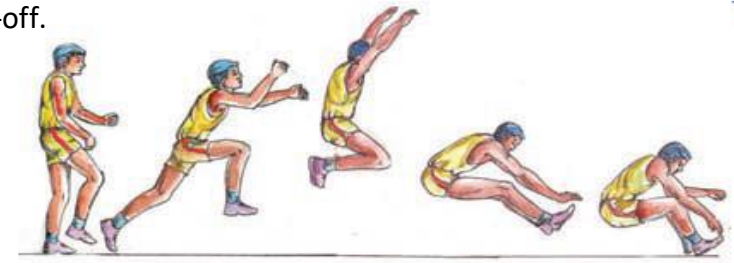
- ✓ The height or the distance of the jump determined on the above factors cannot be changed by the movements that the athlete makes while he is in the air. In an event like long jump, such movements are only useful in preparing the body for a successful landing.
- ✓ The velocity of the take-off is the most important one of the above factors. In jumping events, the approach run is used to increase the take-off speed.
- ✓ The optimum take-off angle differs according to the event. The height at take-off differs according to the height of the body of the jumper and the position of the body of the jumper at the take-off.



14. Write some Factors that determine the distance of the throw?

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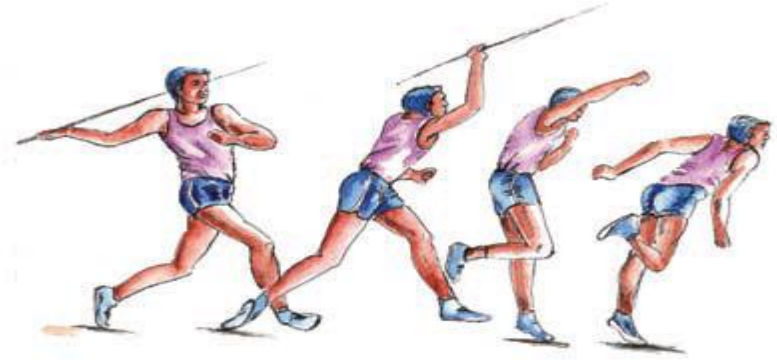
- **Velocity of release of the equipment**

✓ In a throwing event the key factor that determines the distance of the throw of the equipment is the velocity of release of that equipment. The magnitude of the force exerted on the equipment depends on the direction of force, the distance and duration of exerting the force and the speed of release of the equipment. In order to attain the maximum speed of the propellers, the thrower uses different techniques. A discus or shot-put thrower by rotating the body and a javelin thrower by running fast, gets the speed.

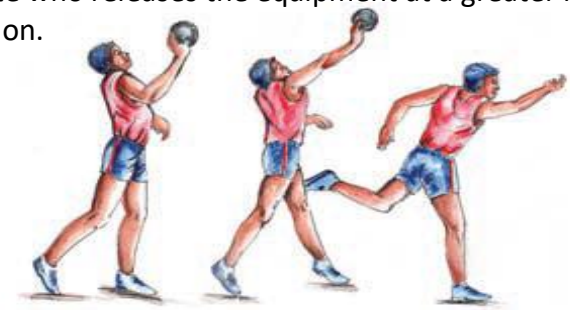


- **Angle of releases of the equipment**

✓ The next important factor is the angle of release of the equipment. In throwing events, the optimum release angle differs from event to event. When a piece of equipment is released in the proper angle, it can be thrown further and when that equipment is thrown at angles greater or lesser in magnitude to the proper angle, the equipment lands at shorter distances.

- **Height of release of the equipment**

✓ In a throwing event, the height of release of the equipment is a factor that depends on the height of the athlete. An athlete who is taller than another can release the equipment at a greater height when compared to the shorter one. If all the other factors are equal, the athlete who releases the equipment at a greater height is in a slightly advantageous position.



04 Let us play Volleyball

- ✓ Two teams of **……. players** in each are needed to play volleyball. Volleyball is played in a court of **……** which has been divided crosswise by a net into two equal halves. The team to serve first is selected through the toss of a coin between the two captains. The play starts as the player on the right back of the selected team serves the ball to the opposing team***. A team can win a point if the ball lands on the court of the opponent's side or due to an offence committed by the opposing team.***

01. What is the National game of Sri Lanka?

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02. When was Volleyball introduced in Sri Lanka? By Whom?

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03. When was Volleyball introduced in the World? By Whom?

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04. Write the skills of Volleyball?

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07. What is the name of the place which volleyball was started?

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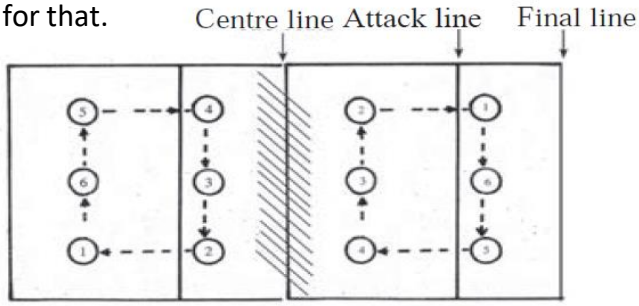
08. Draw the volleyball with measurement.

09. Explain the Positions in Volleyball.

- ✓ When playing volleyball, the players should comply with the following order of rotation of positions:
- ✓ The positions of players in volleyball are numbered. The order in which the players are positioned before the start of the play is considered the initial order of players. This order should be maintained until the end of the particular round of play.
- ✓ the order of players cannot be changed, but a substitution can be made if necessary. If there is any change in the order of players before the start of the play, it can be corrected in accordance with the line-up sheet and players should be positioned accordingly. A penalty is not given for that.

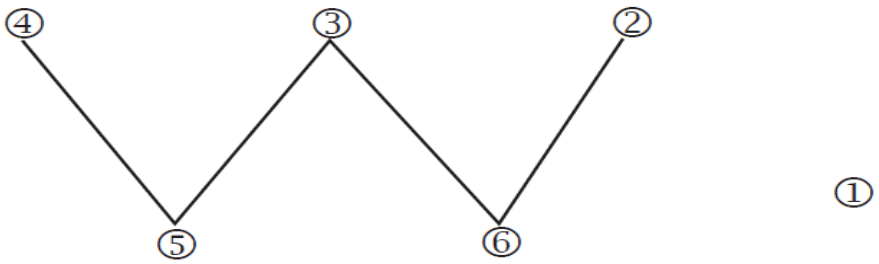
10. Explain the positions of Players.



- ✓ While the ball is being served, all the players of both teams, except for the server, should remain inside the court. The six players of each team should stand in 2 rows of three players each. The three players standing close to the net are called the front row and the other three players are called the back row.

- ✓ The three players in the back row should be positioned behind the players in the corresponding positions of the front row. According to the rules related to the six positions of volleyball, the three positions of the first row are named zone 2,3 and 4, and the three positions in the back row are named zone 5,6 and 1. The server should always be in number 1 position.

- ✓ Although there are several ways of positioning players in volleyball, the beginner players are positioned in a 'W' formation.



- ✓ The position of a player in the court is determined based on the place in which the soles of the player's feet lie. The front row player's foot should lie closer than that of the back row player's foot is to the centre line at least by a small distance. The foot of the side player should lie closer than that of the middle player to the side line. After the ball has been served, the players can play within their playable areas or by moving to any part of the free zone.

11. Mention the Offences related to player positions.

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12. What are the penalties that may be given for offences related to player positions?

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13. How should Player's rotation correctly occur?

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14. What are the penalties for Rotation offences?

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05 Let us play netball

- ✓ Netball is played between two teams of **……. players** each. However, **……. players** can be registered for a netball team, and a netball match can be played with a **minimum of ……. players**. Each player should wear a bib showing the abbreviation that indicates the player position and the two teams should wear **……** of different colours so that the two teams can be identified clearly. The captains of the two teams should toss a coin to start the match. The team that wins the toss can select either the ball or the side of the court. After the toss has been won, the two captains should inform it to the umpires who then toss a coin between themselves to select their roles. When the umpire blows the whistle, the two teams should take their positions inside the court.

01. When was netball introduced in Sri Lanka? By Whom?

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02. When was netball introduced in the World? By Whom?

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03. Draw the netball court with measurement

04. Write the skills of netball?

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05. What are the penalties given in netball?

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06. Explain the Free pass.

- ✓ For all the offences committed by a team, except for the obstructions caused to a player or players of the opposing team (eg: obstructions, impeding contacts, committing offences by two opposing players simultaneously, obstructions related to goal post), the opposing team is awarded a free pass. If a goal shooter gets a free pass when she is within the goal circle, she cannot shoot that ball. Any player in the opposing team who is allowed to play in that area can get the free pass from the place where the offence was committed.

07. Mention occasions where a free pass is awarded.

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08. Mention Offences committed in handling the ball.

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09. Mention Offences related to footwork.

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10. Mention offences related to players.

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11. Explain the Penalty pass.

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12. Explain the occasions where a penalty pass is awarded.

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13. Explain the penalty pass or penalty shot.

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14. Explain the occasions where a penalty pass or penalty shot is awarded.

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15. Explain the Throw-in.

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16. mention the instances where a throw-in is awarded.

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17. Explain Toss-up.

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- ✓ The two players should stand facing each other and their own goal ends with arms straight and hands to sides, but feet in any position. There should be a distance of 3 feet between the nearer feet of the two players. They shall not move from that position until the whistle is blown.
- ✓ The umpire should keep the ball on the palm of her hand that is held at a level that is slightly lower than the shoulder level of the shorter player when she is in her usual standing position, and should blow the whistle and toss the ball up from a midpoint between the two players so that the ball does not go more than two feet up.

18. Explain a toss-up is taken when.

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19. What are the things that should be judged by two umpires before starting a match?

- ✓ It is very important that netball matches are judged following the rules and regulations of the game giving players the relevant penalties in order to control netball games and to make decisions. A netball match is judged by two umpires and it is their responsibility to ensure that the following are in order:

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06 Let us play football

- ✓ Football is a game played between two teams with **……. players each.** Each team tries to score goals by kicking the ball into the opposing team's goal. It has won recognition as the most popular sport in the world as it has become the game that is watched by the most number of people. In football, the players, except for the goal keeper, cannot touch the ball with their hands during play. Hence, they engage in play employing a variety of skills……. The game was started in **……** in Sri Lanka.

01. Write the skills of football?

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02. What are the instances where a kick-off is used in football?

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03. Explain the procedure for kick-off.

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04. What are the instances where the ball is out of play?

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05. What are the instances where the ball is in play?

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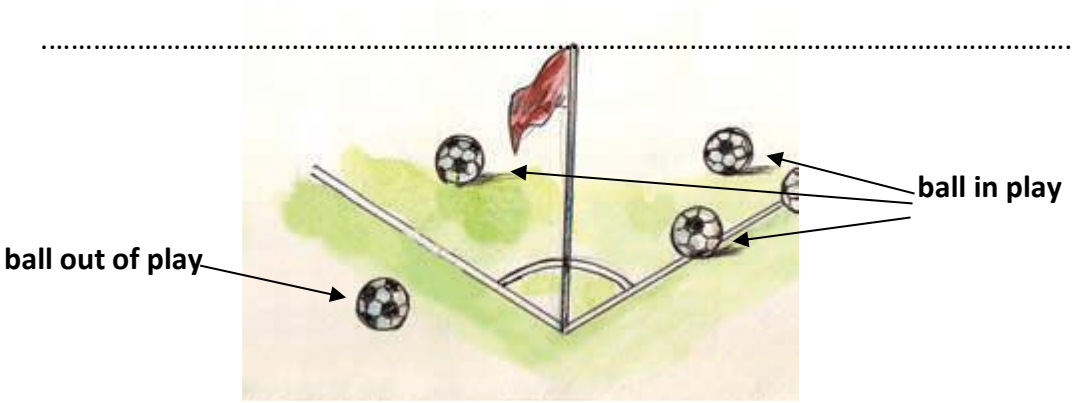

06. Explain the Scoring.

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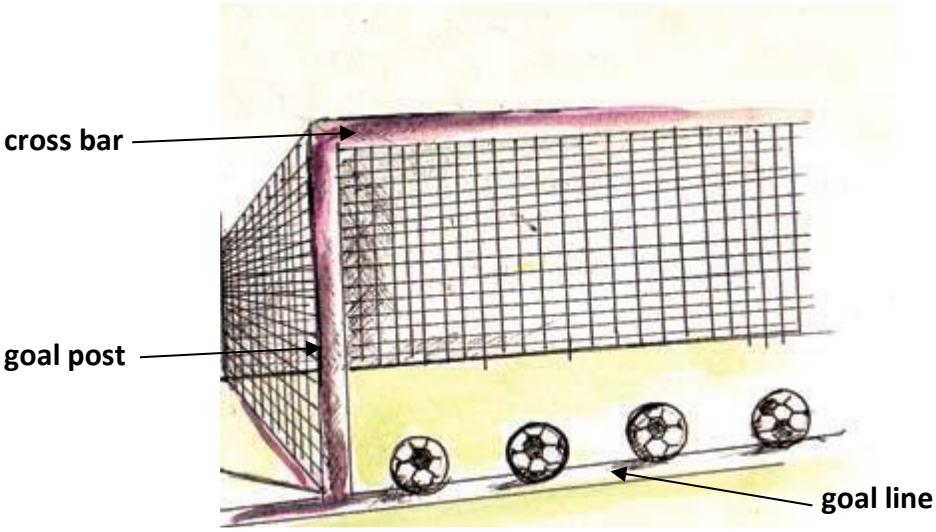

07. Explain the Free Kick.

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08. Write The types of free kick.

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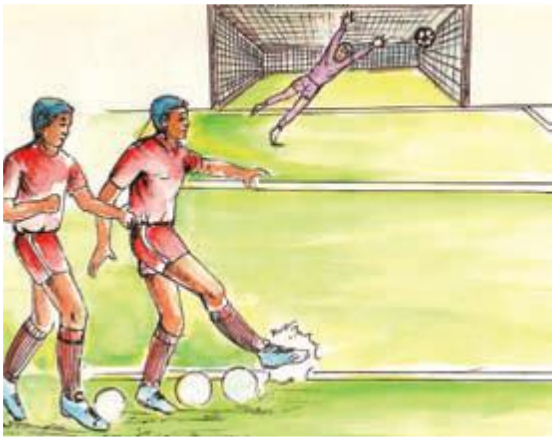

09. Explain the penalty kick.

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10. Explain the facts to be taken into consideration related to penalty kick.

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11. Explain the offside position.

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12. Mention the law of offside position will not be applicable if a player receives the ball Directly.

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13. Explain the Fouls and Misconduct.

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14. Mention Fouls and Misconducts happening from players for a direct free kick.

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15. Explain Throw-in.

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16. What should be taken into consideration when the throw-in is taken?

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17. Explain the goal kick.

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18. What should be taken into consideration when taking the goal kick?

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19. Explain the corner kick.

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20. What should be taken into consideration when taking the Corner kick?

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07 Let us use equipment adapting correct postures

01. What is correct posture?

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02. Write the types of correct posture with an example.

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03. What are the advantages we can gain when we use correct postures?

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04. Give 04 harmful effects of bad postures?

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05. What are the features should be maintained when pushing an equipment?

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06. What are the features should be maintained when pushing a vehicle?

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Correct posture **Incorrect posture**

07. What are the features should be maintained when pulling an object?

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08. Write down the nature of the posture that should be maintained when lifting an object.

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Correct posture **Incorrect posture**

- ✓ Lifting objects in incorrect postures can harm the body. a person who tries to lift an object by bending the body forwards. The line of gravity of the person lies outside his supporting base in this posture. Therefore, the total weight of the object has to be borne by the spine and it could damage the spine.

09. Write down the nature of the posture that has to be maintained when lowering an object from a hight.

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Correct posture **Incorrect posture**

- ✓ a person is trying to lower some object by standing a little away from the object and placing the both feet close together. When this person is standing in this posture, his body does not lie straight. Then the line of gravity lies behind the supporting base. That makes it difficult for him to maintain the balance of the body.
- ✓ the picture which shows the correct posture, the body of the person lies straight. One leg has been moved backwards and the supporting base is wider. The weight is held close to the body.
- ✓ By adopting incorrect postures, you will lose your youthful appearance and the beauty of your body. In pushing, pulling, lifting or lowering objects, adopting incorrect postures can damage the spine and muscles.

08 Let us engage in outdoor activities

01. What are the 03 facts to be followed in organizing outdoor activities, when acting according to a plan?

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02. What are the facts to be concerned at pre-preparation for an outdoor activity?

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- **following information should be included in the information sheet:**

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► Gaining knowledge related to the following before engaging in the activity is important:

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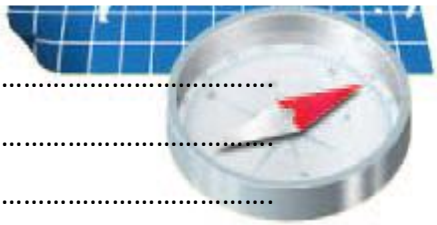

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- **A list of items that are commonly needed given here:**

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03. What are the facts to be concerned at implementation for an outdoor activity?

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04. What are the facts on which attention should be paid at the group meeting at the end of the activity?

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05. Write some outdoor activities.

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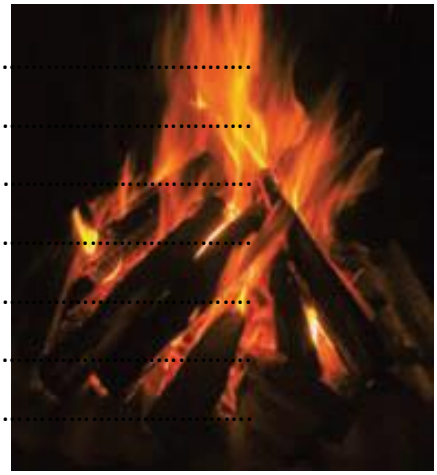
06. Write some of the skills that we should develop in studying jungle crafts.



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07. What are the challenges confronted when studying jungle crafts?

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08. Write some Important observations in overcoming the challenges confronted in the Wild?

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- **Some examples for using landmarks are as follows:**

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09. What are the strategies that we can adopt while we are in a forest area?

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10. What is Mountaineering?

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11. What are the facts to be taken into consideration in mountaineering?

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12. What is the prime objective of jungle exploration?

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13. What are the facts that special attention should be drawn to in jungle explorations?

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09 Let us learn about running events in athletics

01. What are the features that should be in cloths of the athletic taking part in athletic events?

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02. What are the rules and regulations related to wearing of shoes in athletics?

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03. How should Athletes use bibs?

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04. Mention the general rules and regulations related to the running track?

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05. Write the general rules and regulations for field events (jumping / throwing events)?

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06. Write the two key factors that determine the running speed?

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- **Running speed can be increased either by increasing the stride length or by increasing the stride frequency or by increasing both those factors. However, it is important that those two factors are maintained at a moderate level.**

07. Write the two main techniques for starting the run in a running event? With examples.

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- **According to the classification of athletics events, running events are divided into three types namely,**

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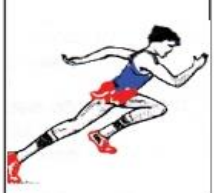
stage and the command	on your marks	get set	go
postures			

08. A running stride consists of three phases:

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Take - off **Flight** **Landing**

09. Explain the short distance running (Sprints).

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- ✓ **You have already learnt that the crouch start is used for sprints. For the crouch start there are three commands namely,**

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10. Explain the sprinting technique.

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11. Explain the long distance running.

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12. Explain the running technique in middle-distance and long distance running.

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13. Write the running exercises.

- ✓ In previous lessons you have learnt about running exercises and about the benefits gained by engaging in running exercises. Let us study some more exercises that can be used to practise the running technique as well as to increase the running speed.

- ➢ **Ankling -** Walking fast with very short strides so that the balls of the feet touch the ground.

- ➢ **Skipping A -** Moving forwards fast so that each foot strikes the ground alternatively during skipping stride.

- ➢ **Skipping B -** Moving forwards skipping with one foot while the other foot is swung forward alternately.

- **Bounding -** Exerting pressure on the ground with the supporting foot and bending the knee and walking with leaping strides.

14. Explain the hurdling.

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15. What are the hurdling events that are held in sports competitions at national and international levels?

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16. Write the two key phases of the hurdling technique?

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17. Clearing the hurdle can again be divided into three phases…….

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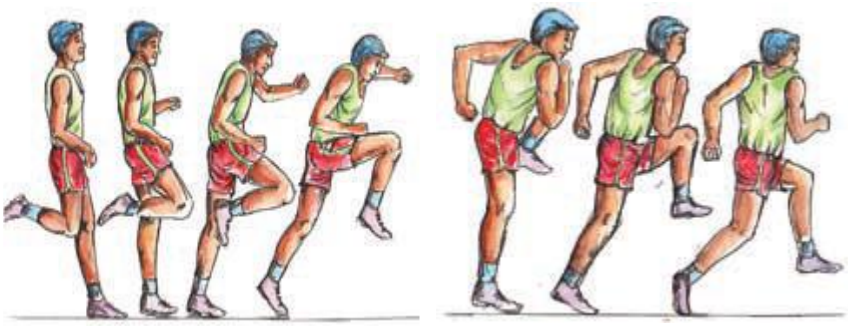
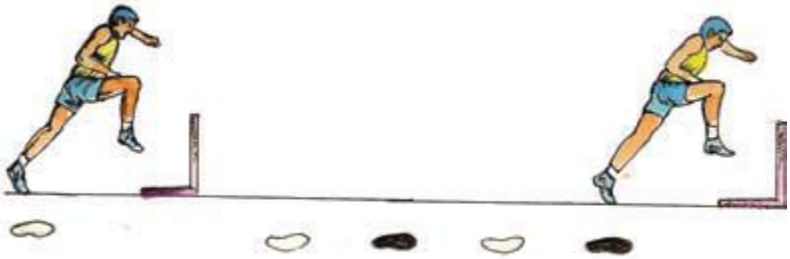


18. running between hurdles……

- ✓ In 100 m and 110 m hurdling events, the first hurdle should be reached with eight steps from the starting block.
- ✓ It is important to position leading leg on rare block of the starting block so that the first hurdle is approached with the leading leg. (This can be changed for beginners)

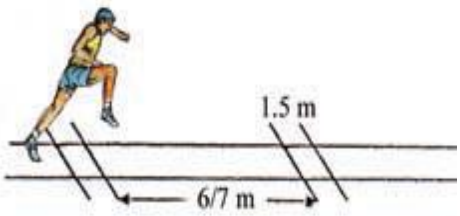
- ✓ In 100 m and 110 m hurdling events, the next hurdle should be approached with three steps.



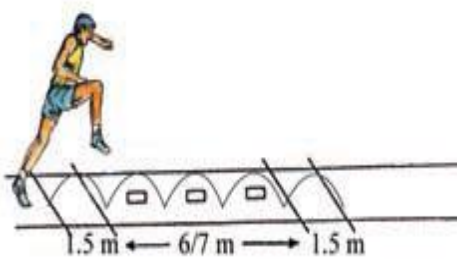
19. Write the training exercises for hurdling.

- ➢ Place in a limited area of the playground some obstacles like cardboard boxes that are not very high, and run about freely jumping over the boxes from time to time.

- ➢ Mark some gaps on the ground as shown in the picture. Run the 7-meter gap in three steps jumping over the 1.5-metre gap.



- Now place some small obstacles in the 1.5m gaps and continue doing the same activity.



20. Write some key rules and regulations of hurdling events.

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10 Let us cooperate with management and organizing through sports

01. What is organization?

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02. What is organizational structure?

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03. Write the several features that are common to organizations?

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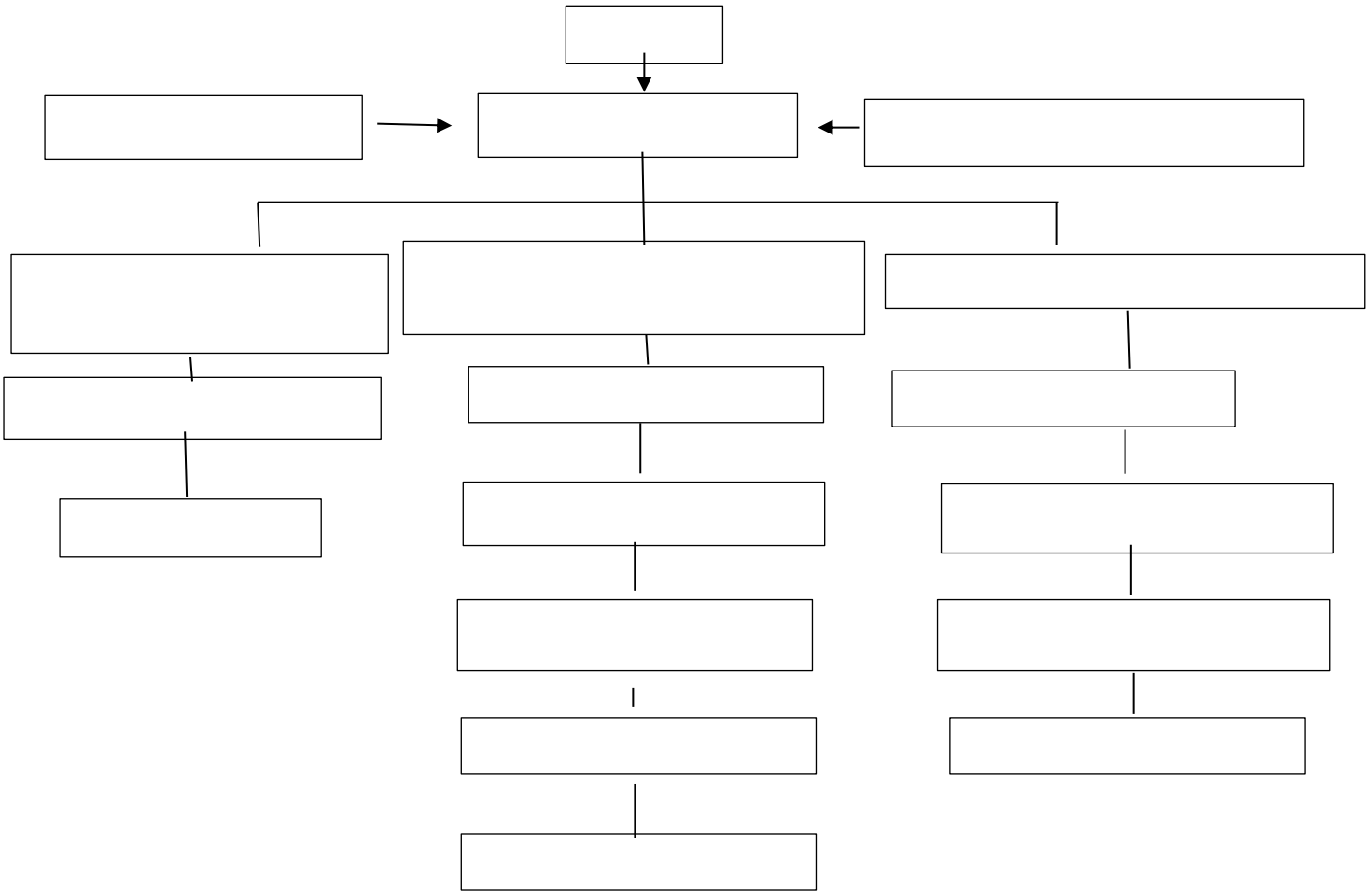
04. Draw organizational Structure of a School.



05. Who is Manager?

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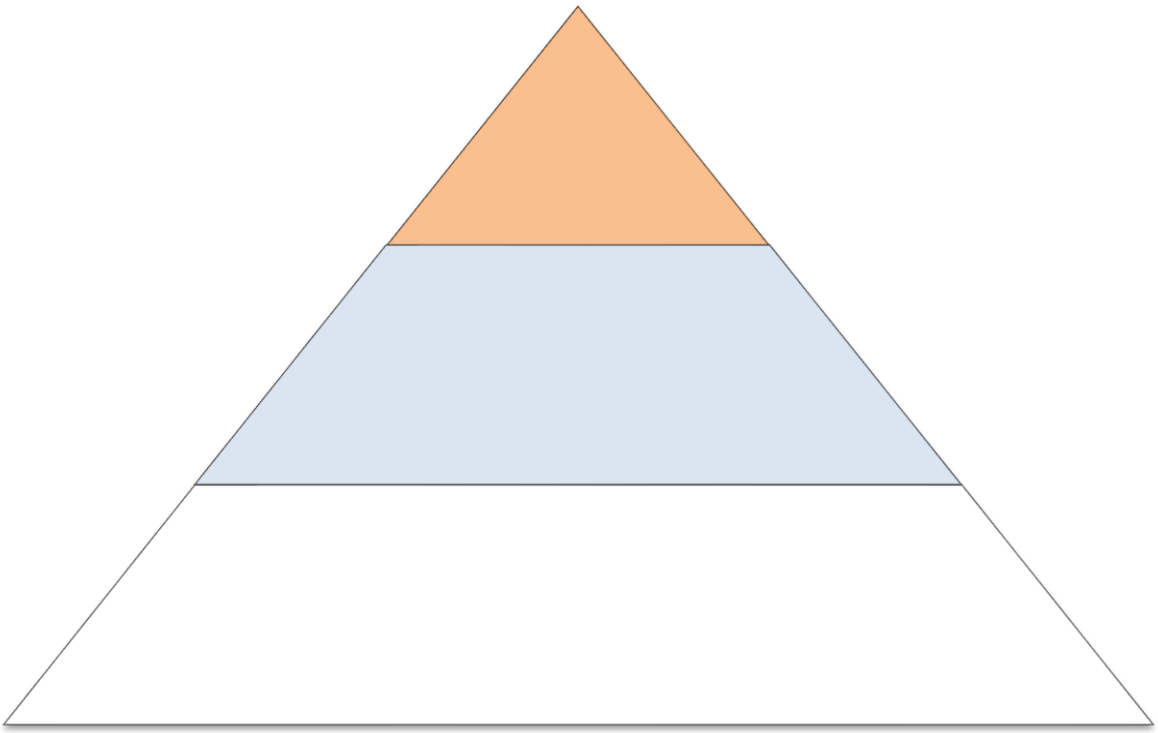
06. Draw the management of an organization consists of three tiers.



- ✓ Generally, there are managers belonging to different levels of management of different fields in society.
- ✓ As far as the school education sector is concerned as a whole, the Secretary to the Ministry of Education is the chief manager and the principal of a school is in the lower management, but as far as a school is concerned, the principal is in the top management.

07. Write the qualities that a manager should possess.

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08. Who is the Follower?

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09. Write the qualities that a follower should possess.

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10. Explain the role of physical education management.

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11. What is resource management in physical education?

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12. What are the steps to management of physical resources in physical education?

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13. What is fulfilled by the management of physical resources?

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14. Physical education programmes that can be managed within school can be divided into three main categories.

- ✓ **Compulsory physical education programmes**

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- ✓ **Co-curricular physical education programmes**

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- ✓ **Physical education programmes conducted outside school**

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15. Write down some of the benefits you can enjoy by participating in physical education programmes conducted at school:

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- ➢ pupils who have special talents in sports get the opportunity to further develop those talents Participating in sports activities enables pupils to maintain a healthy body and also to engage actively in studies with a peaceful mind. It also helps the pupils to relieve the monotony and stress caused by continuous studies.

- ➢ Manage your time properly so that at least an hour can be allocated every day for engaging in sports activities which helps you to maintain a good physical, mental and social balance.

16. Write some facts to be taken into consideration when planning physical education activities:

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17. What are the aims of organizing inter-house sports competitions.

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18. Name the three main phases in the organization of a sports meet.

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19. Various committees can be appointed at the discretion of the Organizing Committee and those committees can be assigned with different tasks.

Committee	Activities to be implemented

20. What is tournament?

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21. What are the several ways of preparing the draw.

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22. What is Knockout tournament.

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- **how the draw is prepared in each type is explained below:**

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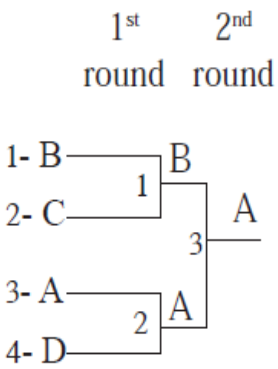
01. The draw of the tournament when the number of teams is a power of two.

Numbers like 2 (2^1), 4(2^2), 8(2^3), 16(2^4), and 32(2^5) are powers of two. Suppose that four teams namely A,B,C, and D take part in the tournament. When chosen by lot, team B got No. 1, team C got No.2, team A got No. 3, and team D got No. 4. (Look at the draw)



In the first round, B and C play each other and then A and D play each other. If B wins in the match between B and C, and if A wins in the match between A and D in the first round, the second round (the final round) will be played between B and A. According to this example, A is the winner.

Calculating the number of matches to be played using the formula

Number of matches = n -1 (n = Number of participating teams)

Number of participating teams = 4

n = 4

The number of matches to be played = n -1

Accordingly the number of matches = 4 - 1

= 3

02. The draw of the tournament when the number of teams is not a power of two

If the number of teams participating in the first round is not a power of two, the number of teams coming to the second round should be made a power of two. This is done by awarding 'byes' in the first round.

How byes are awarded

Byes are awarded in various ways. Let us study an example in which byes have been awarded in the bottom – top method.

Suppose that the number of teams participating in the tournament is six.

Step 1

Find the number that is the next power of two that comes after six which is the number of teams.

The next power of 2 after 6 $= 2^3$

$= 8$

Step 2

Reduce the number of teams (i.e. 6) from the next power of 2 that comes after 6 (i.e. 8).

number of teams to which byes should be awarded $= 8 - 6$

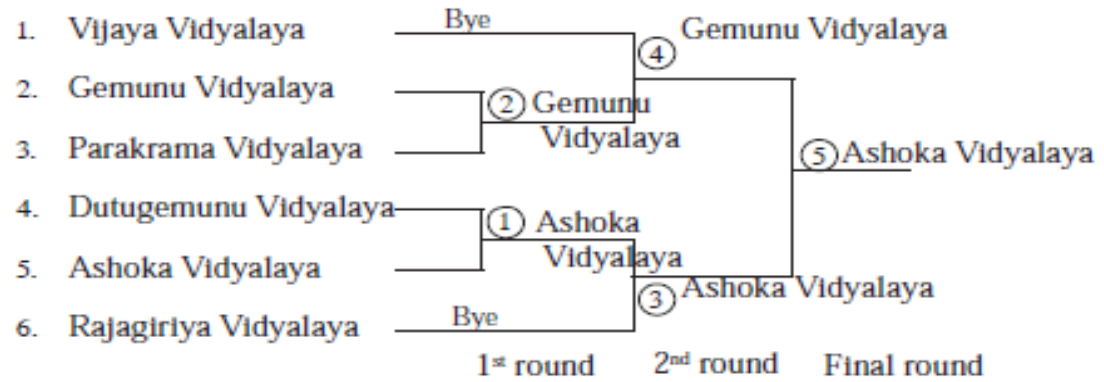
$= 2$

The number of participating teams is 6 and the number of byes that should be awarded is 2.

Step 3

Select the order of teams by drawing lots between team captains. After arranging the teams in the order, award byes for two teams each from the bottom and from the top.

Diagramme 10.3



According to this example, Ashoka Vidyalaya is the winner.

When the number of participating teams is higher, competitions are held dividing the teams into quarters. Then byes can be awarded using cue-chart.

23. Advantages of single elimination or knockout tournament.

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24. Disadvantages of single elimination or knockout tournament.

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25. What is League Tournament?

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Calculating the number of matches based on the formula.

$$\text{The number of matches played under league method} = \frac{n(n-1)}{2}$$

eg:

If the number of teams participating in the tournament = 6

$n = 6$

$$\text{Number of matches played} = \frac{n(n-1)}{2} = \frac{6(6-1)}{2} = \frac{6 \times 5}{2} = 15$$

For easy study, how the draw is prepared for league tournament has been divided into two.

I. When the number of participating teams is an even number.

II. When the number of participating teams is an odd number.

In the draw the teams can be rotated either clockwise or anti-clockwise, but number 1 is kept stable.

I. Preparing the draw when the number of participating teams is an even number

Here, number 1 has been kept stable. The draw has been prepared by rotating the numbers of the other teams from the second round onwards.

Rotational change of match numbers

Round 1	Round 2	Round 3
1 - 2	1 - 8	1 - 7
8 - 3	7 - 2	6 - 8
7 - 4	6 - 3	5 - 2
6 - 5	5 - 4	4 - 3

Round 4	Round 5	Round 6	Round 7
1 - 6	1 - 5	1 - 4	1 - 3
5 - 7	4 - 6	3 - 5	2 - 4
4 - 8	3 - 7	2 - 6	8 - 5
3 - 2	2 - 8	8 - 7	7 - 6

The teams that play each other in the first round

1 and 2
8 and 3
7 and 4
6 and 5

The teams that play each other in the second round

1 and 8
7 and 2
6 and 3
5 and 4

The two teams to play each other in each round is decided upon in this way.

The number of participating teams - 8 (n - 8)

The number of matches - $\frac{n(n-1)}{2}$

- $\frac{8(8-1)}{2}$

- $\frac{8 \times 7}{2}$

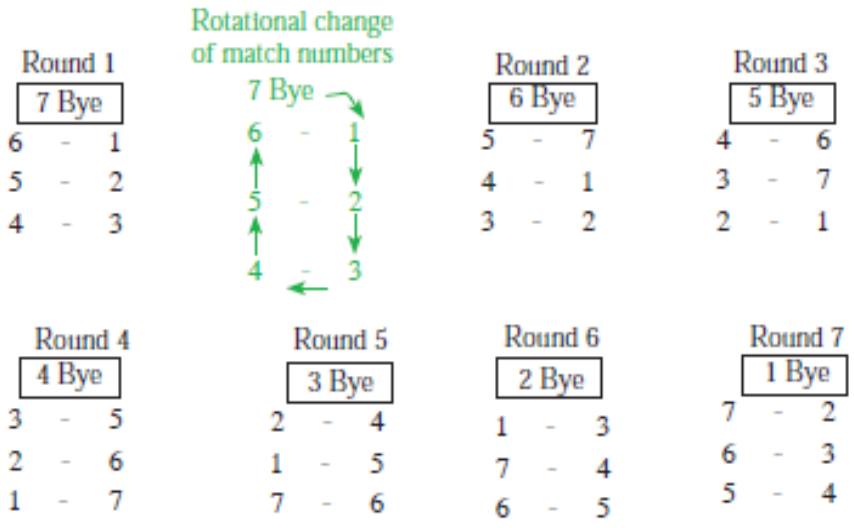
- $\frac{56}{2}$

The number of matches played - 28

II. Preparing the draw when the number of participating teams is an odd number

When the number of participating teams is an odd number, one team is awarded a bye in one round. After one team has been awarded a bye, other teams are paired. The numbers of the teams can be rotated either clockwise or anti clockwise.

In the following example, the number of participating teams is 7 and the numbers have been rotated clockwise from the second round onwards.



The teams that play each other in the first round

6 and 1
5 and 2
4 and 3

The teams that play each other in the second round

5 and 7
4 and 1
3 and 2

The number of matches $= \frac{n(n-1)}{2}$

$= \frac{7(7-1)}{2}$

$= \frac{7 \times 6}{2}$

$= \frac{42}{2}$

The number of matches played = 21

The following method can be adopted in this tournament to select winners:

The team that wins the match gets 2 points.
If the match ends in a draw, both teams get 1 point each
The team that loses the match gets '0' points.
The points that each team gets in all the matches are added together and the winner of the tournament is selected based on the total number of points each team has obtained.

26. Advantages of the league tournament.

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27. Disadvantages of the league tournament.

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28. Compare the advantages and disadvantages of knockout tournaments and league tournaments.

Feature	Knockout tournament	League tournament

11 Let us consume nutritious food for a healthy life

01. Write some importance of nutritious food?

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02. What is Food safety?

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03. Write the factors that affect food safety?

- ✓ **Biological factors**

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- ✓ **Chemical factors**

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- ✓ **The Ministry of Agriculture recommends that the harvest should not be gathered until two to three weeks have passed since the last use of agrochemicals.**

- ✓ **Physical factors**

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➢ Instances where action should be taken to ensure food safety

04. What are the actions taken to protect manufacture of food within the farm land?

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05. What are the actions taken to protect manufacture of food within the factories?

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06. What are the actions to be taken on food safety during Transportation of food?

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07. What are the actions to be taken on storage of food?

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08. What are the actions to be taken on food safety when storing inside the refrigerators and deep freezers?

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09. What are the actions to be taken on food safety when preparing food?

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10. What are the actions to be taken on food safety in consumption of food?

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11.What is food Spoilage?

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12. What are the causes of food spoilage?

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13. What are the ways of recognizing spoilt food?

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14. Write the negative outcomes of food spoilage?

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15. What is known as food Adulteration?

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16. Write down many ways in food adulteration.

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17. Write some problems arising due to food adulteration?

- ✓ **…….**
  - Use of adulterated food can give rise to diseases as well as discomfort.
  - eg: Tartrazine, which is added to cordials, can cause poor sleep at night.

- ✓ **…….**
  - Reduction in the amount of nutrients received due to addition of other substances to food.
  - eg: The nutritional requirement which one expects to fulfil by drinking a glass of milk, cannot be achieved when milk is adulterated with water. Iodine deficiencies occur when non-iodized salt is labelled as iodized salt and sold in the market.

- ✓ …….
    - There is a drop in sales when people suspect adulteration and avoid consuming food from these places. Losses can occur even due to legal action and banning of products. Furthermore, as people contract diseases due to food adulteration the expenses borne by the government for medication and health services increase.

18. Write some methods of identifying adulterated food?

- ➢ Chemical and physical methods are used to identify food adulteration. According to the colour, shape, smell and texture the adulterant can be identified. Simple methods in identifying food adulteration are mentioned below.

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19. What is food Poisoning?

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20. Write some instances where toxic substances get incorporated into food?

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21. Write some causes of food poisoning?

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22. What is food Allergies?

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23. What are the causes of food allergies?

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24. Write some clinical features of allergies?

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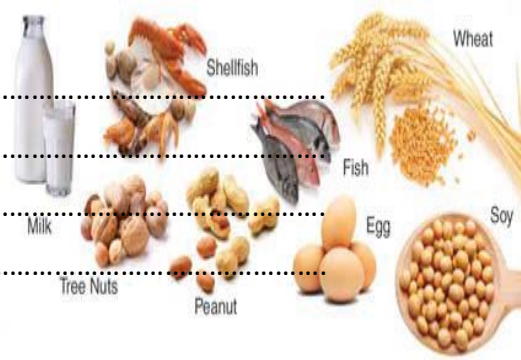
25. Write some food that commonly cause allergies?



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26. Write some steps to be taken to prevent allergies?

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➢ Let us protect the nutritional value of food

27. What are the actions to be taken to protect the nutritional value of food?

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28. Many types of food are found in the market. Write the types of that.

✓ **Natural food**

- Natural food includes food that has had minimal preparation to preserve its natural quality. They do not contain artificial flavours, dyes or aromatics and are healthier than pre prepared food. Natural food contains a lot of antioxidants and therefore helps to protect from diseases such as cancer. In addition, they contain a large amount of fibre. Even natural food can have an less favourable effect on the body in instances such as cutting vegetables long before cooking and use of chemical fertilizers in place of organic fertilizers.

- ✓ **Processed food**

- Processed food includes food that has been prepared in a manner easy to use or to increase shelf life. Additives are commonly used for flavour, colour and aroma. These foods have high calorie content and less fibre. Therefore, by consuming these foods the risk of contracting diseases increases.

- ✓ **Fast food and Junk food**

- Food that is made in a manner that enables it to be prepared for consumption over a short period of time is known as instant food. These can be seen in several forms.
- Dried food
- Food that can be consumed after adding water. eg: tea, coffee, milk powder, soups
- Food that can be consumed after adding other
- ingredients and a short cooking process. eg: noodles

- ✓ Some types of fast food are suitable according to health standards while others are not. Therefore, it is important to be vigilant about the ingredients of these food items when selecting them. Food, which is high in energy, sugar and oil content and low in other nutrients, are unhealthy and are defined as junk food. Therefore, even though fast food has the advantage of saving time and provides ease in cooking you must be intelligent enough to avoid what is unhealthy among these foods and select only healthy food.

12 Let us learn about jumping and throwing events in athletics

- ✓ Under the classification of athletics events **long jump** and **triple jump** can be identified as **horizontal jumps** while **high jump** and **pole vault** come under **vertica**l **jumps.** The shot put, the discus, the javelin and the hammer are the throwing events in athletics.

01. Name 03 jumps relevant to triple jump.

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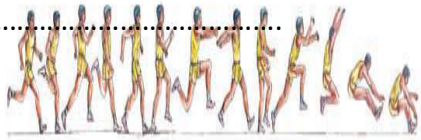

02. What are the 05 phases in the triple jump?

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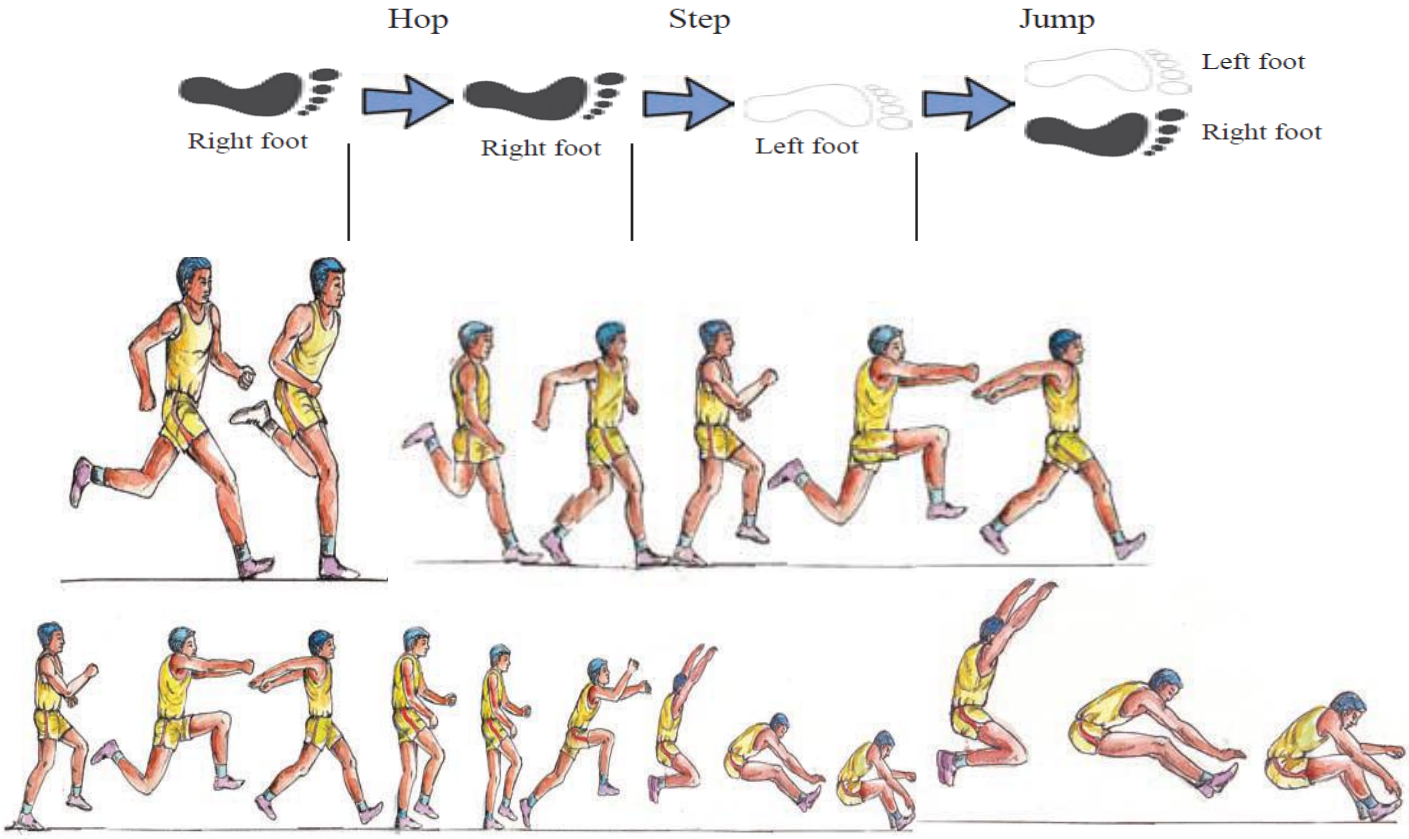
In triple jump, the second take-off should be made using the same foot that was used for the first take-off while the third take-off should be made with the leg opposite to that. Finally the landing should be made with both legs.



04. Draw the triple jump runway and landing pit.

05. Write some training exercises for triple jump.

- ✓ Place in some limited area a few cardboard boxes or similar objects that are not very high and that do not pose any danger, and run about the area freely jumping over those obstacles.
- ✓ When jumping over the obstacles the landing should be done with the same foot that was used to make the take-off.
- ✓ Mark some area on the ground and move about in that area by jumping forwards keeping to the hop, step and jump order.
- ✓ Mark a frame of lines and practice the three phases of the triple jump, hop, step and jump.

06. Write the Rules and regulations of triple jump.

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Javelin throw

- ✓ When you were in grade 10 you learnt about the shot put and the discus which comes under field events according to the classification of athletics. Javelin throw, too, comes under throwing events. Out of the equipment used for putting and throwing events, javelin is a piece of comparatively lower-weight equipment.
- ✓ The javelin is thrown by using the power that is gained by running.
- ✓ As the shot put, throwing the discus and the javelin are events that involve dangers. Therefore, training of those events and holding competitions should be done only under the supervision of teachers.

07. List out the Javelin throw technique. Javelin throw technique can be divided into 7 phases:

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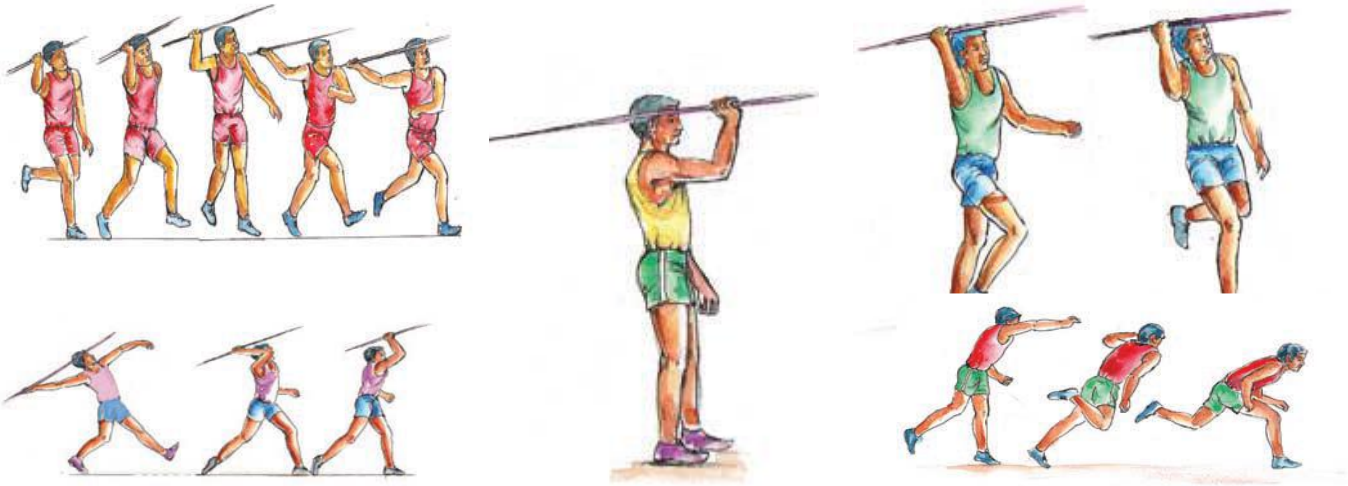
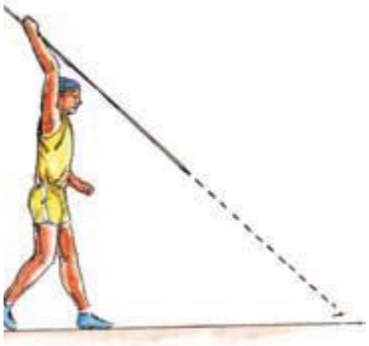


08. Write some exercises for practicing javelin throw.

- ✓ Throw to a distance from over the head a light ball such as a tennis ball.

- ✓ Pull the javelin backwards over the head and throw it hard onto the ground so that the point of the javelin hits the ground about 3 – 4 metres ahead.



- ✓ Throw the javelin staying at the power position.
- ✓ Practise throwing the javelin following the last three phases of the javelin throw technique described above.

09. The field for javelin throw.

- ✓ The minimum distance of the javelin throw runway should be 30 metres.
- ✓ The angle between the sector lines should be 290.

10. Age-wise weight of the javelin used in all island school athletics competitions in Sri Lanka.

Age limit	Boys	Girls
Under 16 years	600g	500g
Under 18 years	700g	500g
Under 20 years	800g	600g

(New values introduced in circular 2016/34)

13 Let us understand the musculoskeletal system

✓ We are constantly in motion during the whole span of life. Three systems in our body that help us to do this are the

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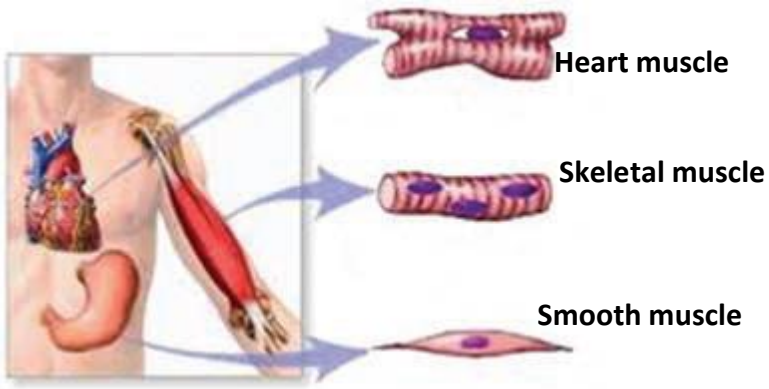
Muscular system

✓ **Anatomy of the muscular system**

- Different types of muscles perform specific actions in various parts of the body.
- Different postures can be adapted due to the contraction and relaxation of muscles
- Tendons are attached to bones. They are thick and strong and help with movement.
- The muscles are attached to the bones and help with movements
- The energy needed is stored in the muscles
- The nerves send stimuli for contraction and relaxation of muscles and help with movements
- Special muscles in the face are involved when crying, laughing, showing happiness and sadness.

✓ **There are three types of muscles classified according to the function and structure**

- Skeletal muscles
- Smooth muscles
- Cardiac muscles



✓ **Skeletal muscles**

- These muscles constitute 40% of the body weight.
- They are long and cylindrical in shape. The two ends are attached to the bone by tendons. They are called striated muscles due to the horizontal striations seen in the muscle.

- The muscles are controlled by the brain. They contract in a rhythmical manner and get tired. There are more than one nucleus and a large number of mitochondria in a muscle cell.
- Glycogen is stored as a source of energy in the muscles. Striated muscles are present in the arms, legs and diaphragm

✓ **Smooth muscles**

- These muscles constitute about 3% of body weight. There is one nucleus in the muscle cell.
- The muscles are long and the striations are not seen. They contract in a slow, rhythmical manner and do not get fatigued.
- Smooth muscles are present in walls of arteries, veins and the digestive tract

✓ **Cardiac muscles**

- The cells branch out. Each cell has one nucleus. A large number of mitochondria are present in the muscle cells.
- These muscles contract nonstop in a rhythmic manner right throughout one's life.
- Cardiac muscles are present only in the heart.

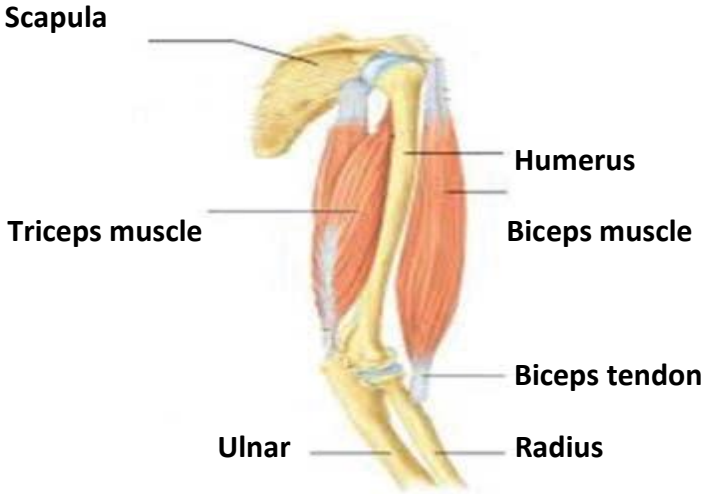
✓ Functions of the muscular system

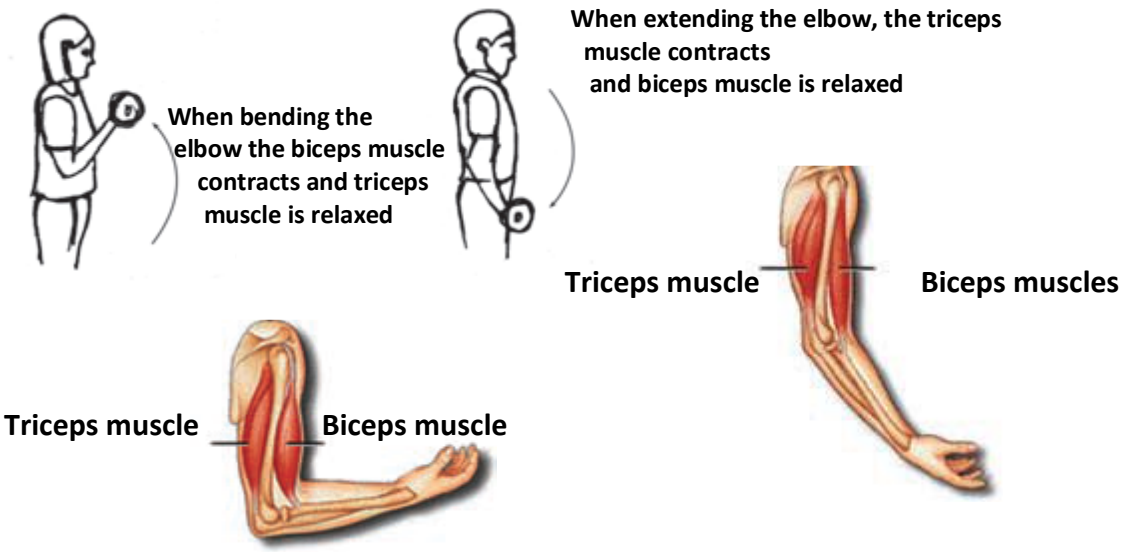
- Aids in body movement by contraction and relaxation
- The heat generated during muscle contraction is used to maintain the body temperature
- Storage of glycogen needed to generate energy
- Intercostal muscles and diaphragmatic muscles aid in respiration.

✓ How does muscular system work?

➢ **Contraction and relaxation of muscles**

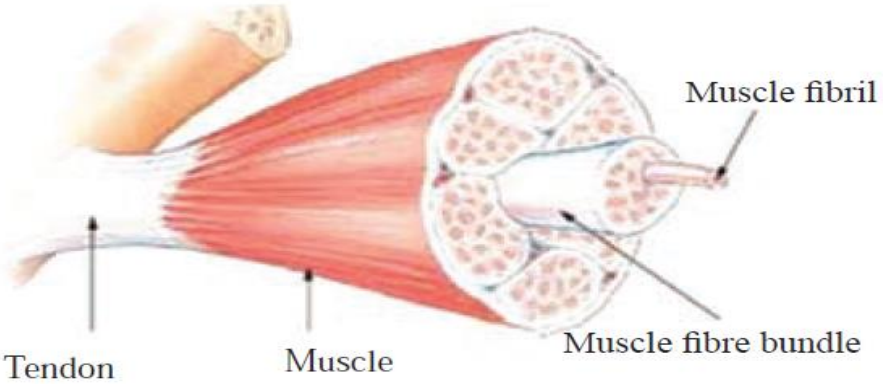
- The skeletal muscles help in movements and to maintain posture. The muscles have a narrow end and a broad middle. They are designed to help with movements that will be efficient





- ✓ When the elbow is bent the biceps muscle contracts and triceps is relaxed. When elbow is extended the triceps contracts and the biceps is relaxed.

- ✓ The basic structural unit of an organism is a cell. The basic unit of a muscle is known as a muscle fibre. Figure 13.4 shows how multiple muscle fibres make a muscle bundle and many muscle bundles make a muscle.



Ratio of fibres

- ✓ You have learnt about the structure and function of muscle fibres. Recall how your friends play in the grounds. One friend can run very fast but gets tired soon and another can run slowly for a long period without getting tired. Various types of muscle fibres help in these situations.
- ✓ The energy needed to perform a task generated by a muscle is known as **muscle energy**.
- ✓ The muscles of the student who runs fast will contract and relax very quickly.
- ✓ Whilst the muscles of the student who runs slowly for a long period will contract and relax slowly.

- ✓ Sports medicine has helped the progress of sports immensely.
- ✓ Two types of fibres have been identified. They are
  slow twitch fibres
  fast twitch fibres.
- ✓ The fast twitch fibres are further categorized into two. In this grade you are expected to study
- ✓ **slow twitch**
- ✓ **fast twitch** fibres only.
- ✓ You are born with a particular ratio of these twitch fibres. The friend who **runs very fast has a higher ratio of fast twitch fibres to slow twitch fibres** whilst the friend who **runs slowly has a higher ratio of slow twitch fibres to fast twitch fibres.**

1. Slow twitch fibres- STF; Type 1

- These fibres are also known as red fibres as oxygen is utilized to generate energy (red blood corpuscles transport oxygen). These fibres have a lot of capillaries. The sportsmen with a high ratio of these fibres have the ability to run long distances successfully.

2. Fast twitch fibres FTF; Type 11

- Oxygenation (need to use oxygen) in these fibres is low. These fibres do not utilize oxygen to generate energy. Therefore, the ability to contract is more in these fibres. Sports persons with a higher ratio of these fibres can perform events that require speed such as sprints, jumps, throws and excel at them.

Identify the differences between these two fibres.

Characteristics	Fast twitch fibres	Slow twitch fibres
Colour	white	red
Storage food (glycogen)	more	less
Speed of contraction	more	less
Aerobic respiration	less	more
Anaerobic respiration	more	less
Resistant to fatigue	less	more
Involved in high impact sports	more	less
Involved in long duration	less	more

• Uses of skills training in sports

- ✓ The area of the cross section of the fibre can be increased. Strength can be developed by doing resistance exercises.
- ✓ The number of units in motion are more. Impulses travel to the fibres fast and the velocity is increased. Therefore, the fibres contract very fast.
- ✓ The number of mitochondria present in fibres increases. The production of ATP and storage increases. Thus, one does not get tired quickly.
- ✓ The density of blood vessels in the muscles increases. The number of capillaries in the muscles increases. This enables the rapid transport of glucose and oxygen to the muscle cell. Excretory products are also transported out rapidly. Thus, performance can continue for a longer period.

• The factors that hinder the functioning of the muscular system

✓ **Nutritional deficiencies**

- The development of muscles is affected due to nutritional deficiencies from the time you are a foetus right until you pass the other developmental stages

✓ **Wrong postures**

- Wrong postures tire the muscles and cause muscular ailments. When muscles are not used properly a lot of energy is used. Therefore, wrong postures over a long duration can lead to various diseases.

✓ **Inadequate amount of exercise and rest**

- The muscles are affected when the body does not get adequate exercise. Rest is needed for cells to regenerate. A person can have physical ailments if he works for a long period without rest. It is important that you do warm up exercise when you engage in sports or exercises, as the muscles can get damaged.

• Ways to Protecting the muscular system

✓ **Good eating habits**

- Balanced meal including calories is important to protect the muscular system. It is important to eat at regular times and to eat natural food as much as possible. It is necessary that you eat high quality proteins and non-vegetarian food.

✓ **Maintain good postures**

- Fatigue felt by muscles can be minimized by maintaining a correct posture. Maintaining good postures help to have healthy muscles.

✓ **Taking adequate exercise and rest**

- An adult should engage in at least 30 minutes of exercise daily. Exercise develops the function of muscles, capillaries that are connected to them and nerve endings. Getting at least six hours of sleep a day regenerates the tired body. The worn-out cells are regenerated and muscles remain the original state by rest. It is important that one does warming up exercises before sports or exercises.

• Skeletal system

✓ **Special characteristics of the skeletal system**

- The skeletal system that comprises 206 bones.
- The brain is protected by the thick and rounded skull.
- The eyes are protected by the sockets.
- Ball and socket joints help perform a wide range of movements
- The digits in the fingers help with the ability to hold
- The female's pelvic bones are designed to assist with child birth
- Ribs protect the heart and lungs
- The femur is long, broad and strong to bear weight.
- Cartilage at end of bones protects the bones within a joint.
- A bone heals even if it fractures
- Bone marrow manufactures blood corpuscles

➢ The bones cannot function alone. Muscles help in movement. Human bones are initially formed with cartilage and subsequently replaced by bone cells. The deposition of minerals makes it hard. Most bones are hollow. The marrow in the hollow portion of the bone manufactures blood cells. Bones store calcium and phosphate.

Classification of bones depending on the shape

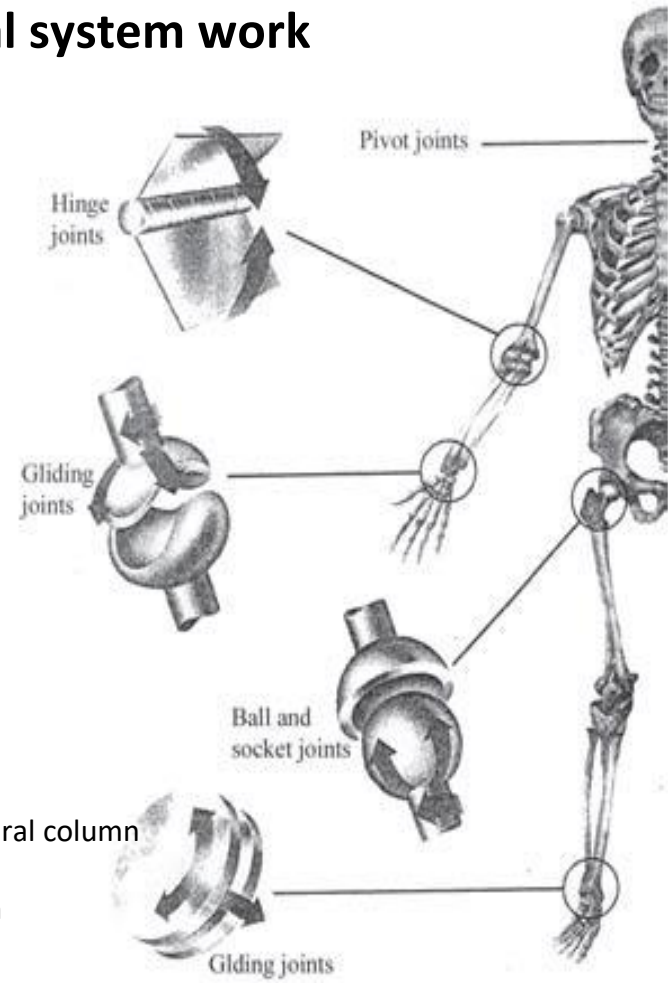
- Long bones- present in arms and legs
- Short bones- present in the fingers and toes
- Flat bones- skull, ribs, shoulder blades and pelvic bones
- Irregular bones- spine, some bones in hands and feet

Functions of the skeletal system

- Gives shape to the body
- Bears the weight of the body
- Muscles are attached to bones by tendons for movement of joints
- Manufactures blood corpuscles
- Stores minerals such as calcium
- Protects the internal organs

How does skeletal system work

✓ Joints that help in movements



- **Hinge joint**

• This movement is similar to a door being opened and shut. The joint acts similar to the hinge of a door.
• Movement is not more than 180x
• Examples for this joint are the elbow, knee, and digits of fingers and toes.

- **Ball and socket joint**

• This is similar to a ball in a corresponding cavity
• Movement is 360x
• Examples are shoulder joint and hip joint

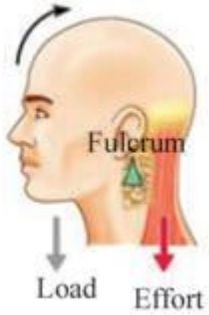
- **Pivot Joint**

• The joint where the Atlas (1st vertebrae) and Axial vertebrae (2nd vertebrae) meet in the vertebral column
• This joint has been designed so that the head can be moved from side to side and up and down

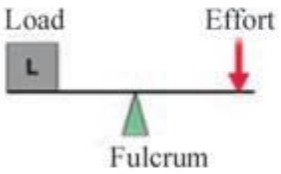
- **Gliding Joint**

• Ankle and wrist joints have gliding joints
• Movements can be performed to the front and back left and right Bones and muscles act as levers during movements. A lever is a rod that can be moved around a stable point. This bone is similar to the rod.
• Fulcrum or pivot is the fixed point in a lever. Joints in our body are examples of this
• The effort is the power on the lever. It is done by muscles.
• The resistance on the lever is the load. A mass raised by the arm is an example.

The movements in our body due to muscle and bones are similar to one of three types of levers

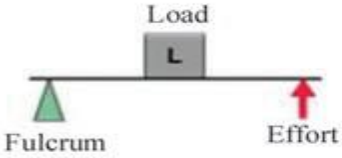


- **Type 1 lever**



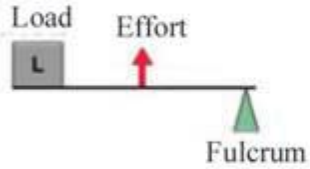
✓ **Effort** - energy is supplied by contraction of muscle
✓ **Fulcrum** - Atlanto - Axial joint between 1st and 2nd vertebrate
✓ **Load** - weight of head

- **Type 11 levers**



✓ **Fulcrum** - the toes on the floor
✓ **Effort** - the gastrocnemius and soleus muscles of leg contracting
✓ **Load** - the weight of the body being directed down along the line of gravity

- **Lever type 111**



✓ **Fulcrum** – elbow
✓ **Load** - put shot
✓ **Effort** - biceps contracting to get the power

Factors that hinder the functioning of the skeletal system

- ✓ Accidents
- ✓ Congenital bone diseases
- ✓ Poor posture
- ✓ Nutritional deficiencies and obesity
- ✓ Arthritis

Ways of protecting the skeletal system

- ✓ Good nutrition
- ✓ Healthy life style
- ✓ Maintaining a good posture
- ✓ Exercising daily
- ✓ Obtaining adequate amount of calcium from food

Nervous system

Structure of the nervous system

- ✓ Impulses obtained from the environment can be converted to electrical impulses
- ✓ Impulses are transmitted in a very short time
- ✓ Reactions can occur with or without thinking
- ✓ The brain controls our actions and is able to memorise them

- **The nervous system can be divided into two**
- ✓ Central nervous system
- ✓ Peripheral nervous system

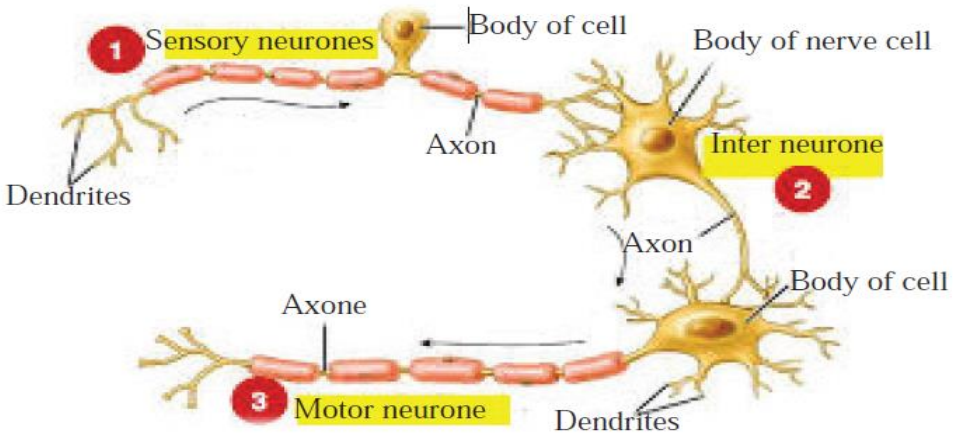
Central nervous system

Brain - The brain and the spinal cord are the components of this system. The prominent part of the brain is the cerebrum. This constitutes left and right hemispheres that are divided by a sulcus. Cognitive functions such as memory, intelligence, responsibility, analysis, decent behaviour and learning are controlled by the cerebrum. Perceptions such as vision, hearing, taste, smell, touch, pressure, pain, warmth and cold are also identified by the cerebrum

Spinal cord - The spinal cord is a cylindrical bundle of nerves that runs down from the brain through the vertebral column. The spinal nerves arise from both sides of the spinal cord in pairs. There are 31 pairs of spinal nerves.

Peripheral nervous system

- The 12 cranial nerves starting from the brain and the 31 spinal nerves arising from the spinal cord constitute the peripheral nervous system. Nerve cells are known as neurons. There are three types of neurons.



✓ **Sensory neurons**

- These nerves transmit impulses from sensory organs to the central nervous system

✓ **Motor neurons**

- These nerves transmit impulses from the central nervous system to the muscles

✓ **Inter neurons**

- Neurons that transmit impulses between sensory neurons and motor neurons

Functioning of the nervous system

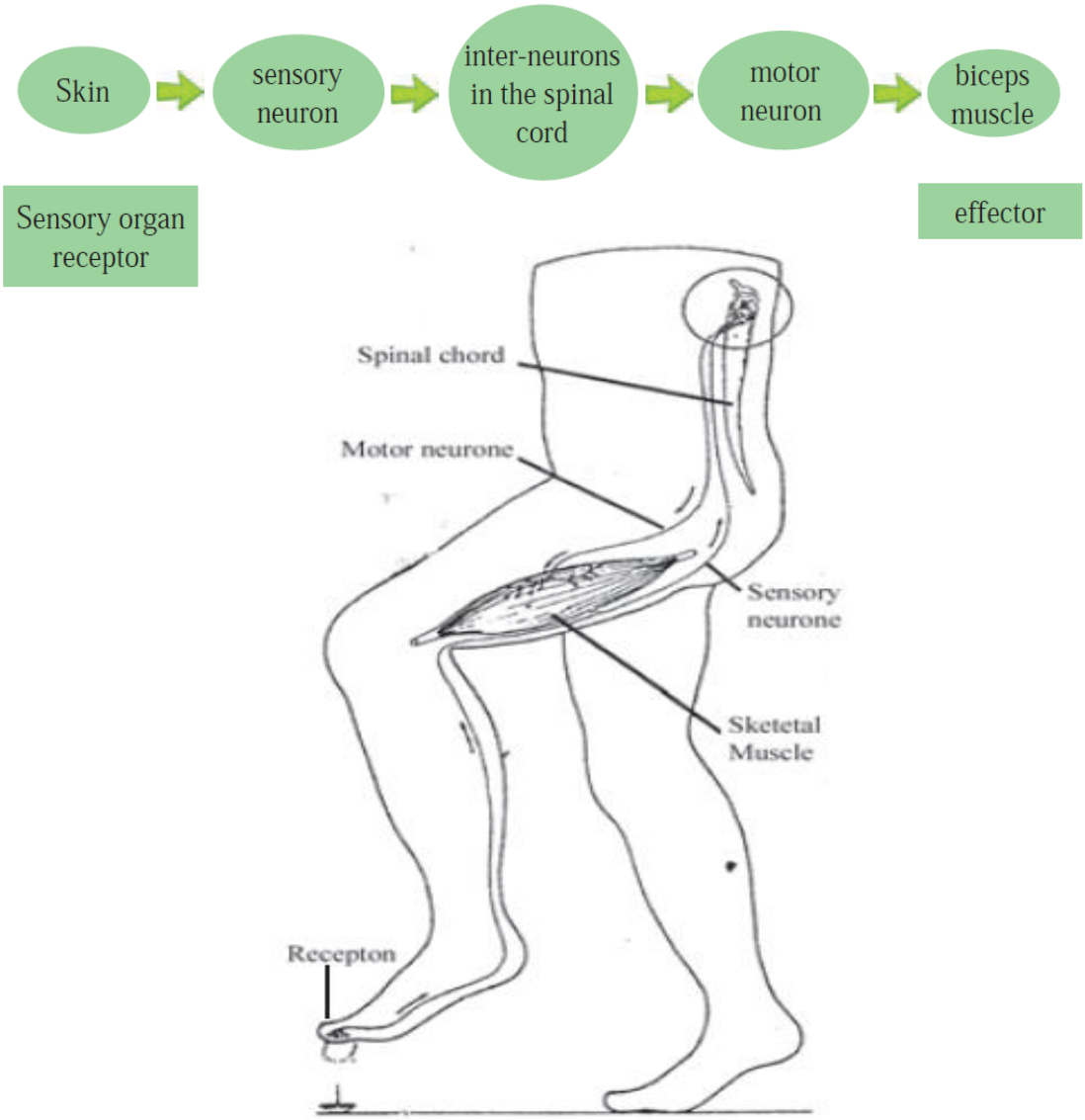
Motor and sensory functions

✓ The dendrites of sensory neurons start from sensory organs. The stimulus is taken up by the dendrites in the sensory organ. The axons of these neurons are situated in the central nervous system. The path of the impulses is directed from the organ towards the brain. The impulses in the motor neurons travel from the central nervous system to the effector which is the muscle.

✓ The sensory organs such as the eyes, ears, nose, tongue and skin receive the stimulus and impulses are sent via the sensory neurons to the central nervous system as messages. The central nervous system send back a message with regards to the action that should take place via the motor neurons to the effector.

Reflexes

- ✓ In sports we think of the action needed to perform. Sometimes we react to an impulse instantly without having to think. This is known as a reflex. Recall how you reacted when your hand touched a hot electric iron. You may remember removing your hand immediately? That is a reflex action.
- ✓ The stimulus is the heat. It feels to the skin slowly. Impulses travel from the skin through the sensory neurons in the spinal cord. The inter-neurons in the spinal cord sends impulses to the hand along the motor neurons. The hand is removed immediately. The message reach the brain little later and after the immediate response the person will realize the incidence that occurred. The harm is minimized as the action is done very fast.
- ✓ The hand is taken off without our knowledge. It is known to us only after the reflex action. This pathway that impulses travel is called a reflex arc.



Conditioned reflexes

- ✓ Scientists say that other than the innate reflexes we are born with, experience can develop reflexes. Reflexes that are developed from experience are known as conditioned reflexes. The pathway to these new reflexes is via the brain. Complex conditioned reflexes compared to the simple conditioned reflexes may not last throughout life.
- ✓ Conditioned reflexes could be developed by systematic training. Thereby complex sports skills can be performed in the correct manner without difficulty.

Factors that cause harm to the nervous system

- ✓ Smoking
- ✓ Using illicit drugs and alcohol
- ✓ Congenital diseases
- ✓ Illnesses that occur during pregnancy and birth
- ✓ Nutritional deficiencies that occur during pregnancy

Protecting the nervous system

- ✓ Refrain from smoking
- ✓ Abstaining from using illicit substances
- ✓ Providing pregnant mothers and adolescent females proper nutrition
- ✓ Exercising
- ✓ Leading a stress-free life and being happy
- ✓ Getting adequate sleep and rest
- ✓ Protecting the eyes, ears, nose, tongue and skin

How energy is supplied during movements

- ✓ We learnt, there is a function of contraction and relaxation of muscles. For this action energy is needed. The energy is generated from ATP (Adenosine triphosphate) in mitochondria that is present in the muscle.
- ✓ **ATP molecule**

- Adenosine – Phosphate – Phosphate – phosphate
  One adenosine molecule is attached to three phosphate molecules. Energy is generated when a bond between two phosphate molecules is broken. This energy is used for the contraction of muscles.
- When ATP gets broken repeatedly ATP gets depleted. After energy is generated adenosine and 2 phosphate groups remains together to form Adenosine diphosphate.

$$ATP \longrightarrow ADP + P + Energy \longrightarrow \text{For muscle contraction}$$

- ADP cannot generate energy again till it is converted to ATP. For that the released phosphate should get attached. Energy needed for the production of ATP occurs in two ways.

1. Anaerobic method

2. Aerobic method

✓ Anaerobic method

- The glycogen stored in the muscles are used for this purpose. In speed events energy is produced without utilizing oxygen. Under this method while producing energy it produces lactic acid. This energy is utilized to convert ADP to ATP.

Glycogen ⟹ Lactic Acid + Energy

- This method can generate only a small amount of energy and also it can be supplied for a short period only. Lactic acid gets accumulated in the muscles and they get fatigued. In the presence of oxygen, the lactic acid is cleared and relieved the muscle from fatigue.
- **In events like 400 running this method is used to produce energy. In the final stages of 800m and 1500m events this method is used. Untrained athletes run the last few stages of a 400m event at a slow speed due to the accumulation of lactic acid.**

✓ Aerobic method

- Glucose and fatty acids are used to generate energy in this method. Glucose or fatty acid in the presence of oxygen produce energy. The energy generated is used to convert ADP to ATP. Carbon dioxide and water are the by-products of this process

$$\text{Glucose} + CO_2 \longrightarrow CO_2 + H_2O + \text{energy}$$

$$\text{Fatty acid} + O_2 \longrightarrow CO_2 + H_2O + \text{energy}$$

- As oxygen is used in this method, it is known as aerobic method.
- **This method produces large amounts of energy. Energy generated by this method in not available very fast. Energy produced in this method is used in sports that take long duration of time such as Marathon, 10000m run etc.**

- Other than above methods there is an another method known as creatine phosphate method.

- **Creatine phosphate (CP)** also known as **Phosphocreatine (PCr),** is a molecule that serves as a rapidly mobilizable reserve of high-energy phosphates in skeletal muscles. When energy has to be supplied immediately, breakdown of creatine phosphate will provide the required.

$$\text{Creatine phosphate} \longrightarrow \text{creatine} + \text{Phosphate} + \text{Energy}$$

- This energy will be used to convert ADP to ATP. This method can function with or without the use of oxygen. As it does not use oxygen, sometimes it is referred to as the Anaerobic Alactic method.
- **Events such as 100m, 200m, 100m x 4 relay, jumps, throws and carrying weight, which require a burst of energy instantly, specially at the beginning (first 2-3 seconds) is supplied by this method.**

Involvement of the muscular system during exercise

- There are many ways that energy is generated for the muscles to act. During high impact exercise and low impact exercise energy is produced in different ways.
- In movements, muscles that are used more and use more force are stronger and bigger. It is due to the cross section being larger,
- By exercising, the endurance and flexibility can be improved.
- The number of mitochondria is increased and ATP increases.
- During training the lactic acid breakdown becomes fast.
- By exercising the activity becomes more efficient depending on the type of muscle fibres you posses

Involvement of the different systems during exercise

- Larger and stronger muscles are situated in places where there is a lot of strain on the body.
- To prevent muscle injury during strenuous activities muscles, get fatigued.
- By training the density of capillaries are increased.
- The time taken to produce lactic acid can be lengthened by training
- By training, cardiac muscles get strengthen Involvement of the skeletal system during exercise
- The limb bones are strong and long to bear the weight of the body and get stronger when exercising
- Presence of ball and socket joints help to increase the range of movements

- The natural position of the atlas vertebra help in a range of movements of the head.
- Muscles are attached to joints which aid in movements and get stronger with exercise.
- The natural position of the vertebral columns helps in the ease and efficiency of movements.
- Presence of arches in the feet help in efficient walking and running.
- The joints in the feet help to absorb the impact of vibration.

Involvement of nervous system during exercise

- Conditioned reflexes are developed
- Unnecessary movements are reduced due to the impulses being directed appropriately
- The parasympathetic nervous system works more during rest
- During exercise the sympathetic nervous system works more
- The organs work more efficiently eg: heart and lungs
- Thirst makes us drink water to compensate for the volume of water that gets excreted as sweat during exercise.
- Fainting attacks occur as a measure to regain oxygen lost during exercise to the brain.

14 related to Let us maintain fitness motor skills

- ✓ In order to lead a healthy life, it is necessary to maintain **physical, mental and social fitness.**
- ✓ Activities that require a large amount of physical exertion in the past are now done easily with the use of modern technology. Furthermore, we are at risk of developing non-communicable diseases from a younger age due to the unhealthy lifestyle.

Components of fitness related to motor skills

01. Name the components in fitness related to motor skills.

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✓ Power

02. What is known as power?

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03. Examples of instances where power is important in sports.

- ✓ **Weight lifting**
  - In events such as snatch and power clean, in order to succeed it is necessary to lift a heavy weight instantaneously. The competitor with greater power would win such an event. The resistance is produced by the weight lifting equipment, which is overcome by muscle strength which will result in movement of the equipment.

- ✓ **Athletics**
    - Events such as throwing the shot put and the take-off of the long jump require competitors to have developed greater power. In throwing the shot put, it is necessary to concentrate the power in your body on to your throwing arm and to let go of the shot put very quickly. This requires training in specific technical skills of throwing the shot put.
    - Similarly, the power exerted on the take-off board in long jump enables the athlete to jump a longer distance. Therefore, the athlete who can instantly release the power in his legs during long jump is able to demonstrate greater skill.
    - **Further examples of how power is useful in sports include;**

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04. Activities to improve power.

- ✓ **Throwing a medicine ball**
- ✓ Medicine balls are made to different weights. The medicine ball can be thrown both forward and backwards using both arms. The ball can be thrown using one arm as well. The steps noted below should be followed when throwing a medicine ball.
    - Stand with both feet parallel to each other.
    - Hold the medicine ball close to your chest using both hands.
    - Bend the knees and move your body downwards, while holding them medicine ball.
    - Raise your body while fully extending your arms and throw the medicine ball as far away as possible quickly.

- ✓ **Jumping exercises (these exercises need to be done quickly)**

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Agility

01. What is agility?

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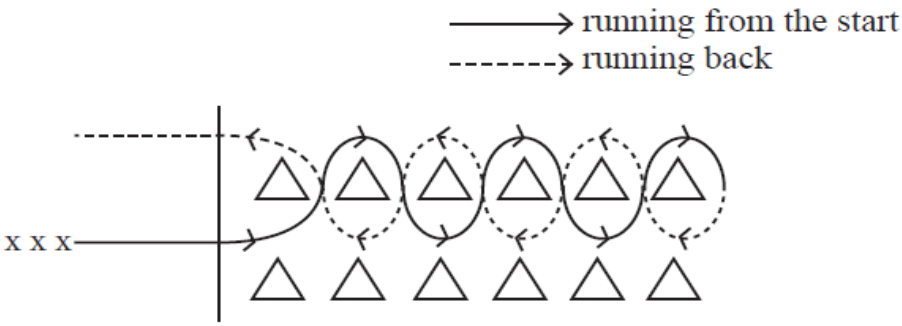
02. Write some examples of instances where agility is useful in sports.

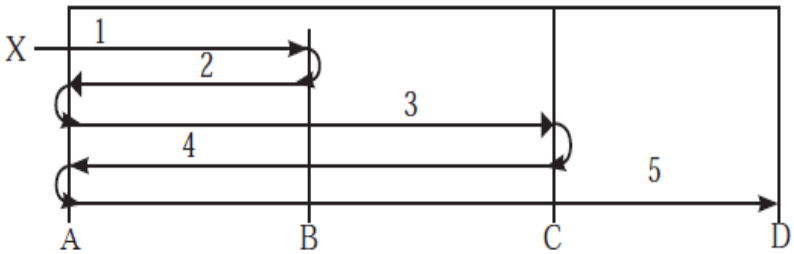
- ✓ In sports such as rugby, football and basketball it is necessary to take the ball to the goal while avoiding the players from the opposing team (in order to avoid one's opponents while moving forward, it is necessary to be able to instantaneously change posture).
- ✓ In sports such as football and hockey, the goalkeeper needs to change his/her posture depending on how the ball is coming towards him/her.
- ✓ Agility is very useful in sports such as javelin throw and hurdles.

03. Write 02 activities to improve agility.

- ✓ **Zig zag run**
  - Arrange cones into two parallel lines with space in between adjoining cones. This enables the participants to weave through them in a zig zag manner.



- ✓ **Shuttle run**
  - According to the figure 14.5 draw four lines named ABCD an equal distance (1m) apart from each other. When a signal is given run from line A to line B and touch line B. Instantly turn around and run back to line A and touch line A. Turn around instantly again and run to line C and touch line C. A person involved in this activity will need to change the posture instantaneously.



Coordination

01. What is Coordination?

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02. Write some examples of instances where coordination is useful in sports.

- ✓ In sports where rackets are used, such as table tennis, squash and badminton, there should be good coordination between the eyes and hands. It is important for the player to see the ball and to move the racket to where the ball is coming from.

- ✓ In parades to act on a given command the participants need to coordinate what they hear with their musculoskeletal system and move their hands and feet accordingly.

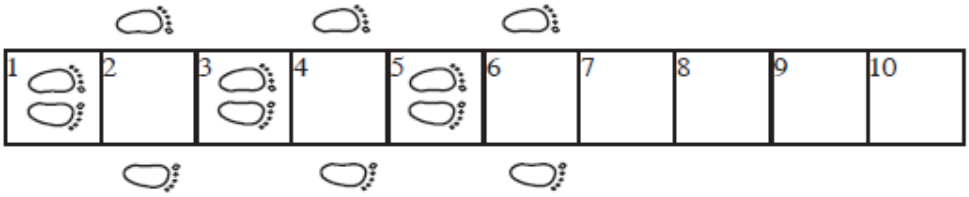
- ✓ Competitors with good coordination excel at sporting competitions.

03. Write some activities to improve coordination.

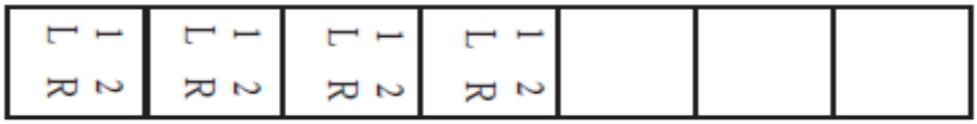
- ✓ **Running ladder**

Draw 10 squares, which are 50cm X 50cm in the playground.

- Jump from one square to the next using both feet as you move forward.
- Next use your left leg to hop from one square to the next.
- Thirdly use your right leg to hop from one square to the next.



- Keep both feet inside the first square.
- Next keep both feet outside the second square.
- Keep both feet inside the third square again.
- In this manner jump forward.



- First keep your left foot in the first square.
- Then keep your right foot in the same square.
- Move your left foot to the second square first and then keep your right foot there.
- Move forward placing your feet in this pattern.

- ✓ **Other exercises**
  - Run on the spot slowly to the rhythm of 1, 2, 3, 4
  - To the same rhythm, first bend your left leg and while raising it forward use your right hand to touch the toes of your left foot.
  - Next bend your right leg while raising it forward and use your left hand to touch the toes of your right foot.
  - Thirdly extend your left foot backwards and touch your toes using your right hand.
  - Fourthly extend your right foot backwards and touch your toes using your left hand.
- ✓ Do this exercise slowly according to the numbers initially, but once you are used to the sequence you can increase the speed.

Balance

01. What is Balance?

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02. Write some examples of instances where balance is useful in sports.

- ✓ In gymnastics, all the movements and the finale need to demonstrate good balance in posture.
- ✓ In weight lifting good physical balance is demonstrated when the athlete lifts the weight above his head at the end.
- ✓ In martial arts a person must be well balanced while delivering a punch to the opponent as well as when landing after an attack.
- ✓ Ballet dancing also requires good balance.
- ✓ In athletics, especially high jump and throwing the shot-put balance is important.

03. Write some activities to improve balance.

- ✓ Jump up and turn half a circle and land on the ground while maintaining balance.
- ✓ Jump up and turn full circle and land on the ground while maintaining balance.
- ✓ Stand on one foot, bend your body forward, extend the other foot backwards and extend your arms to either side. Try to maintain this posture for a brief period (this exercise can be done alternating between the left and right foot).

Speed

01. What is Speed?

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02. Write some examples of instances where speed is useful in sports.

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03. Write some activities to improve speed.

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Reaction Speed

01. What is Reaction Speed?

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02. Write some Examples of instances where reaction speed is useful in sports.

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03. Write some activities to improve reaction speed.

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15 Let us maintain good interpersonal relationships

01. What is known as Good Interpersonal relationship?

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02. Write the importance of maintaining good interpersonal relationships?

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03. Outcomes of different types of interpersonal relationships

	The positive outcomes	The negative outcomes
Media	• Access to information • Access to new knowledge • Opportunity to launch new creations • Improves communication skills • Improves critical thinking • Improves artistic appreciation	• Spread of false rumours • Distribution of disturbing images • Exposure to meaningless programmes • Interference with education • Promotion of alcohol and smoking • Influence people to engage in wrongful activities
Peers	• Learn how to lead and to be a follower • Learn to be flexible • Develop team spirit /camaraderie • Share love and kindness • Receive security and acceptance • Opportunity to learn about others ideas • Learn to identify social issues and take action	Use of alcohol and illicit drugs • Engage in dangerous activities • Engage in misconduct • Making wrong decisions
Other groups	• Learn to emulate other groups • Become a self-learner • Learn about customs and behaviour • Identify different social strata • Gather new information • Receive love and protection	• Use of alcohol and cigarettes • Engage in illegal activities • Exposure to bad influences • Learn harmful ideologies and adverse life styles

04. Write the Important skills in maintaining interpersonal relationships.

- ✓ **……..**
  - Empathy is the ability to understand and share the feelings of another person. An example of empathy is your ability to understand a friend's sadness and help him, if he had to leave a match midway due to an injury which occurred on the playing field.
- ✓ **……**
  - Communication skills are required to exchange ideas, express emotions, hold discussions and solve problems
- ✓ **……**
  - We often have to make decisions, when associating with others. These decisions may include simple decisions such as "What game shall we play this afternoon?" as well as decisions that require deep thinking such as " which stream of subjects should I select for advanced level examination?''. When making a decision, it is important to discuss with others and to respect their opinions.
- ✓ **……**
  - The ability to appreciate your own emotions, beliefs, likes and dislikes is known as self-awareness. It enables us to be aware of the way we should behave during interactions with others.
- ✓ **……**
  - In decision making you must learn to consider all the available information and critically analyse it.
- ✓ **……**
  - It is important to be creative in your thinking when dealing with others, as it would minimise conflicts. As a result of it, you will be a more likeable person to others.

16 Let us identify the challenges in adolescence

- ✓ **The World Health Organization defines adolescence as the ''period between 10 and 19 years of age''.**

01. Why is adolescence an important period in your life?

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02. Write the physical changes during adolescence.

- ✓ **Changes in males**

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- ✓ **Changes in females**

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03. Mention the Mental and social changes during adolescence.

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- **Do you know the reason for these physical and mental changes?**
    - Many of the physical and mental changes in adolescence occur due to the changes in hormones.
    - Due to production of FSH and LH hormones by the pituitary gland, oestrogen is secreted by the ovaries in females and testosterone is secreted by the testes in males.
    - The action of these hormones causes secondary sexual characteristics in males and females.
    - An accelerated growth or a growth spurt is seen because of the action of the hormones. Many changes in the reproductive system such as production of sperm and activation of ovaries occur due to these hormones.
    - **This growth spurt occurs between the ages of 9 and 12 years in girls and between 12 and 14 years in boys.**

- **Your environment too contributes to your mental and social changes.**

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Decisions made during this period tend to be influenced by feelings and with little concern about the outcome. The reason for this is the underdevelopment of the fore-brain. Therefore, remember to take advice from elders (parent, teachers) when making decisions.

04. Mention the problems and challenges during adolescence.

- ✓ **…….**
    - Improperly balanced meals, inadequate food, fast food, food made with large amount of wheat flour, oil or sugar may lead to obesity and other illnesses. Malnutrition at this age will have an effect on your next generation as well

- ✓ **……**
    - Among males, delayed growth of beard, size of the penis, changes in the voice among girl's preoccupation with the size of the breasts, irregularities in the menstrual cycle, pain and discomfort during periods are some problems faced by adolescents.

- Menarche and production of semen depend on various factors such as genetic composition, environment, growth and level of nutrition.

✓ **……**

➢ Pregnancy could occur due to rape or even having sexual intercourse out of ignorance. Getting pregnant leads to many problems as they are mentally and physically not prepared for such.

✓ **……**

- Peer suggestions and attitudes are important at this stage. Unwillingness to go along with them may cause rejection and isolation from the group. As a result, experimenting with illicit drugs, alcohol, smoking and engaging in unsuitable sexual activities at this stage can lead many problems.

✓ **……..**

- Misleading advertising and false propaganda may create problems, if you try to experiment with them.

✓ **…….**

- Difficulties in understanding and remembering school work
- Being scared of the reactions of parents and society due to failure in exams
- Difficulties securing a job due to poor qualifications

✓ **Problems arising from the use of illicit substances such as alcohol, illicit drugs, tobacco and banned stimulants**

- Due to use of illicit drugs, one can be rejected by society, education can be jeopardized, be expelled from school or work place, get involved in theft which can lead to being jailed or sent to probation via the judicial system.
- Using banned stimulants can lead to long term harm to the body or even cause death. In addition, one will be banned from taking part in competitive sports, victory declared null and void and lead to shame.

✓ **Problems due to growth and appearance**

- Both males and females during this period are concerned about the body, complexion, height, being fat or thin, hair, acne and fungal infections. Boys may want to increase their physical strength, while girls may want to improve their appearance.

05. Briefly explain what is known as Unwanted pregnancies?

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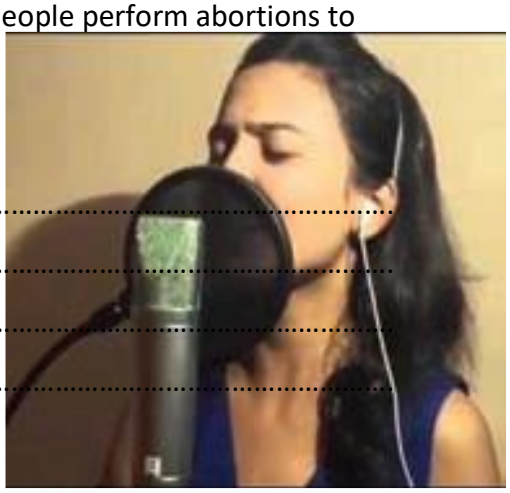
06. Write some factors can be reasons for pregnancy in adolescence.

Physical changes	Psychological changes or social factors

- **Problems that arise from unwanted pregnancies**
  - Becoming a parent before you attain physical, mental, social and financial stability can bring about undesired difficulties for you and the offspring.
  - Some problems can be isolation from society, early termination of education, menial jobs, fear, uncertainty about your and your child's future, early and forced marriages leading to despair, unhappiness and possible divorce.
  - A baby born under such circumstances might be malnourished and may even die at an early age. The society may consider such children as illegitimate and marginalise them. It has been seen that some people perform abortions to avoid unwanted child birth.

07. Write some good qualities of an adolescent.



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08. How to overcome challenges encountered during adolescence.

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17 Let us prevent sexually transmitted diseases

01. what are sexually transmitted diseases?

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02. Explain the sexually transmitted diseases.

- ✓ **Gonorrhoea**
  - **Signs of disease**

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- ✓ **Genital Herpes**
- ✓ This can be transmitted during vaginal intercourse with an infected person as well as from kissing, or having oral or anal intercourse with such a person. Once the virus enters the body, it will be in your system for life and symptoms will manifest on and off.
  - **Signs of disease**

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- ✓ **The disease may occur even after an initial cure due to the following:**

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- ✓ Although can be controlled, a cure has not been discovered for genital herpes as yet.

- ✓ **Syphilis**
  - Symptoms appear between 9-90 days after being infected. Syphilis is contracted chiefly by infection during sexual intercourse, but can pass on to a baby during pregnancy.
  - This can be transmitted via unscreened blood transfusions too.

  - **Symptoms and signs**

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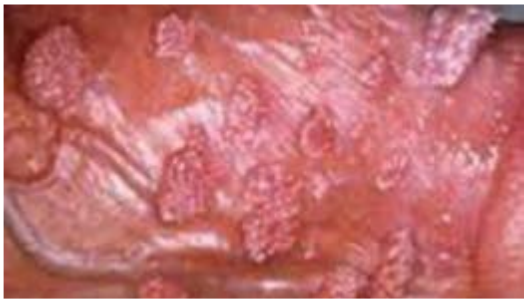

- ✓ **Chlamydia**
  - Chlamydia can be transmitted through vaginal, anal or oral intercourse. There is a possibility of a child born to an infected mother becoming blind.
- **Symptoms and signs**

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- ✓ **Genital warts**
- **Symptoms**

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✓ HIV/AIDS

- HIV/AIDS is caused by the human immunodeficiency virus. Let us concentrate more on HIV/AIDS that has become a major problem.

✓ **HIV/AIDS Methods of transmission**

- Due to unprotected sexual intercourse (among homosexual or heterosexual persons)
- Via unscreened blood transfusions
- From an infected mother to children:
  - during pregnancy
  - during delivery of baby
  - through breast milk
- Using unsterilised needles (injection) by oneself or in a group
  eg: using drugs, creating body tattoos.

✓ Illnesses are prevented by the body's own immune system by destroying germs. When infected with HIV, the immune system gets weak and the body becomes more susceptible to illnesses.

✓ The symptoms of HIV manifest from 3-12 years after the virus enters the body. It may take even 10 years to manifest symptoms. Gradually, the body's immunity decreases. Due to this weakened immunity, other illnesses are contracted which can lead to death.

✓ Any type of infection will make an AIDS patient very ill. Symptoms manifest depending on the type of infection.

➢ Symptoms

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- **In addition,**
  - breathlessness, fatigue and cough lasting a long time
  - inflammation of neck and axillary glands
  - oral candidiasis
  - night sweats
  - loss of appetite

✓ A large number of people are unaware that they are infected with HIV as it takes a long time for symptoms to manifest The HIV virus cannot survive in a normal environment. It can survive in living cells only. The virus is predominantly present in the blood of an infected person.

✓ Other secretions where on the virus can be found

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✓ AIDS is not transmitted by:

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✓ When HIV enters the body, it grows rapidly and produces antibodies.

✓ When AIDS was first identified, it was found that three times more men than women were infected. At present both males and females are equally infected. Women are three to nine times more likely than men to get infected with AIDS because the wall of the vagina is thin and also after intercourse, sperm remain in the vagina for a relatively long period. Further, semen contains more virus than vaginal secretions thus women are more likely to get AIDS than males.

✓ Inadequate support from sexual partner to prevent the spreading of AIDS makes it a serious concern.

✓ Women face many problems within the family and society when they get infected with HIV.

- ✓ A new born of an infected mother is likely to be infected. If both parents are affected, they may die prematurely and their children become orphans. This is likely to become a major social issue.

✓ Detecting HIV infection

- ✓ **Blood tests to detect HIV antibodies**

There are two tests available:

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- ✓ If either of these tests is positive for HIV, a further confirmatory test has to be performed as these are only screening tests. They cannot detect HIV during the first three months which is called the window period.

- ✓ **Confirmatory test**
    - Western Blot test

Importance of HIV testing

- ✓ Once diagnosed as infected with HIV, ART (Anti-Retroviral Therapy) can be given
- ✓ By taking ART, quality of life and life span can be increased
- ✓ When proper treatment is taken, the concentration of the virus is reduced and the chances of infecting another person is become minimal
- ✓ By identifying infected people, the illness can be prevented from spreading
- ✓ By taking ARV (antiretroviral drugs), maternal transmission of the virus during pregnancy and breastfeeding can be reduced.
    - If you have had unprotected sexual intercourse, it is important that you get tested for HIV. Testing for HIV is done at all veneraeology clinics in government hospitals island-wide free of charge and confidentiality is maintained.

Prevention of HIV and other sexually transmitted diseases

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People who have a higher likelihood of being infected with HIV and other sexually transmitted diseases

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Contact Number – 0758424573

Purpose - I expect this Grade 11 Health Worksheet book is designed to learn their lessons easily to my beloved students.

I think it's an easy way to study your lessons.

Thank you…