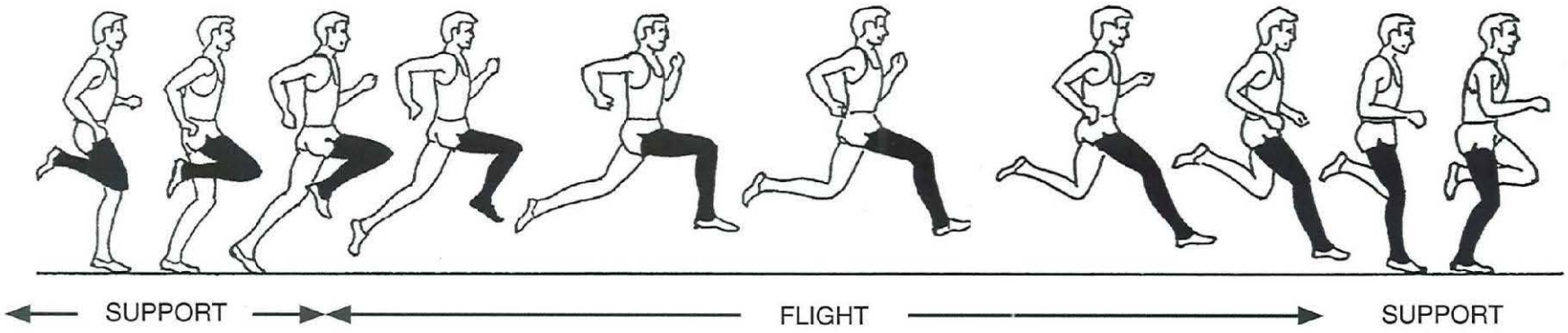
短 跑
SPRINTS

Credit: RUN! JUMP! THROW! The official IAAF Guide to Teaching Athletics

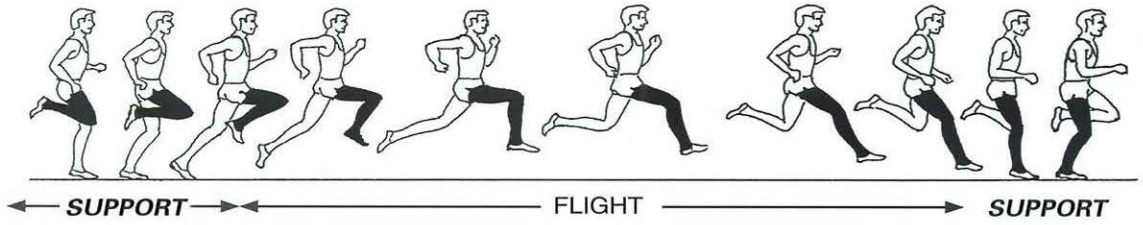


Sprints – Whole Sequence

Phase Description

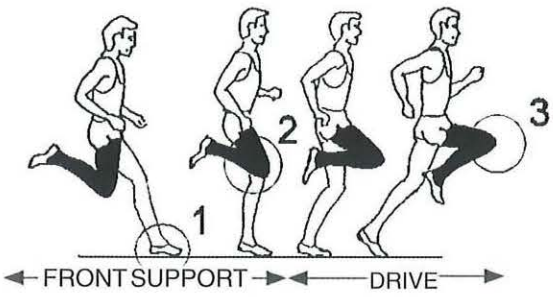
Each stride comprises a SUPPORT PHASE (which can be divided into a front support phase and a drive phase) and a FLIGHT PHASE (which can be divided into a front swinging phase and a recovery phase).

- In the support phase the sprinter's body is decelerated (front support) then accelerated (drive).
- In the flight phase the free leg swings ahead of the sprinter's body and extends for the touch– down (front swing) while the other leg bends and swings to the sprinter's body (recovery).



SUPPORT PHASE

Front Support Drive

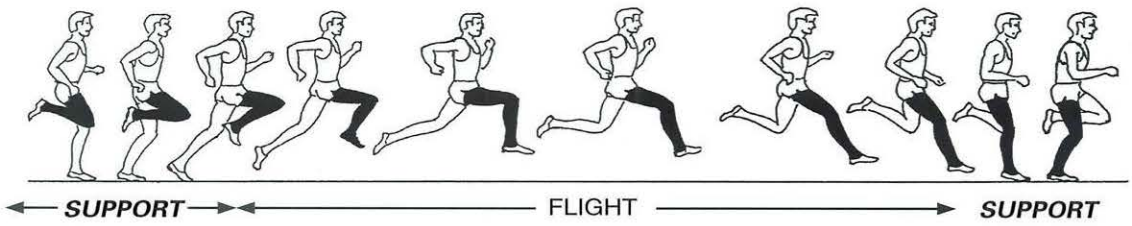


Objective

To minimise deceleration at touchdown and to maximise forward drive.

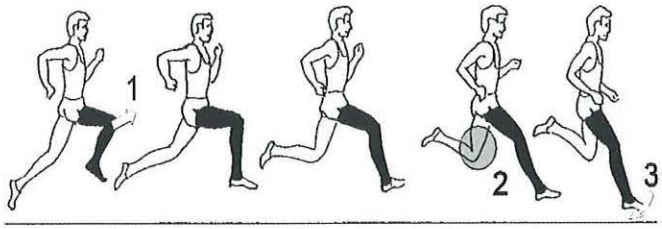
Technical characteristics

- Landing is on the ball of the foot. (1)
- Knee bend of the support leg is minimal during amortization; the swing leg is doubled up. (2)
- Hip, knee and ankle joints of the support leg are strongly extended at take off.
- Thigh of the swing leg rises quickly towards a horizontal position. (3)



FLIGHT PHASE

Recovery Swinging



Objective

To maximise the forward drive and to prepare for an effective foot plant at touchdown.

Technical characteristics

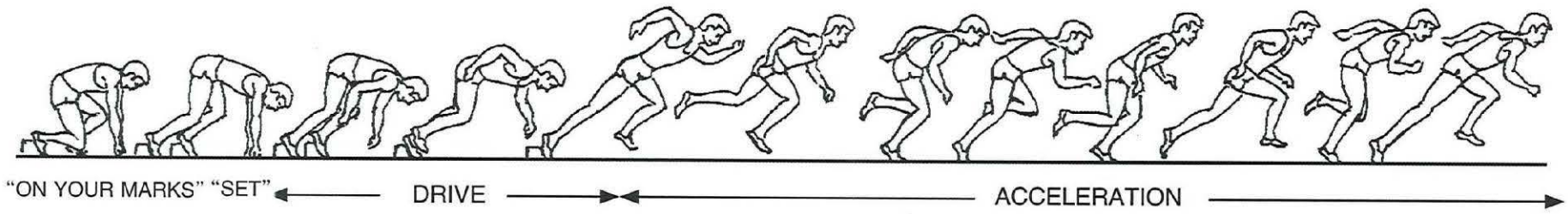
- Knee of the swing leg moves forwards and upwards (to continue the drive and increase stride length). (1)
- Knee of the support leg flexes markedly in the recovery phase (to achieve a short pendulum). (2)
- Next support leg sweeps backwards (to minimise the braking action at touchdown). (3)

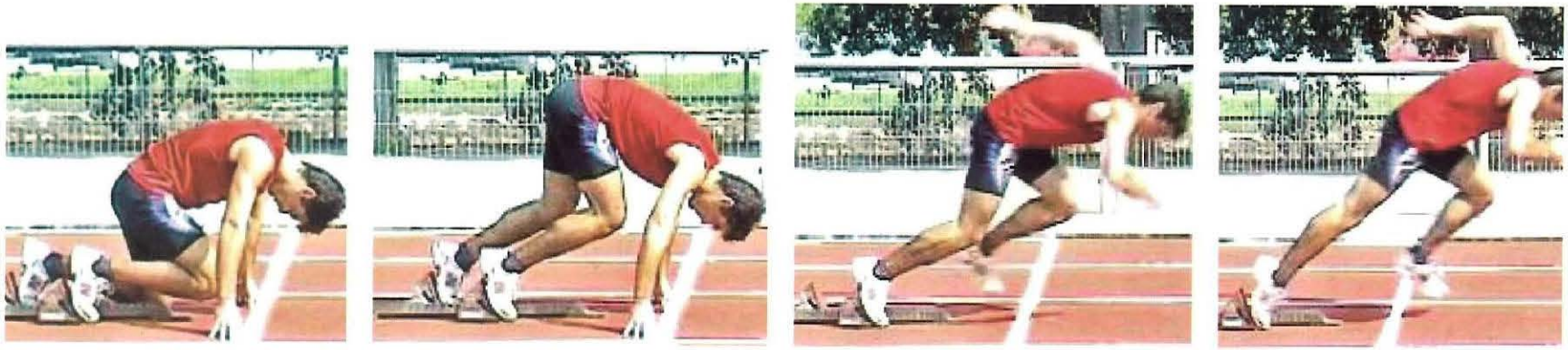
Essential sprinting rules

1) If the sprinter starts before the gun has been fired, they are considered making a false start. Any athlete responsible for a false start shall be disqualified.
2) The starting blocks should be used in the events up to 400m.
3) The sprinter's spikes should not more than 9 mm long when running on a cinder track.
4) The shoes should not have more than 11 spikes.
5) During competition, athletes should wear the number cloths both in front and at the back.
6) Athletes shall be placed in the order in which any part of their bodies (i.e. torso, as distinguished from the head, neck, arms, legs, hands or feet) reaches the vertical plane of the nearer edge of the finish line as defined above.

蹲踞式起跑
CROUCH START

Credit: RUN! JUMP! THROW! The official IAAF Guide to Teaching Athletics



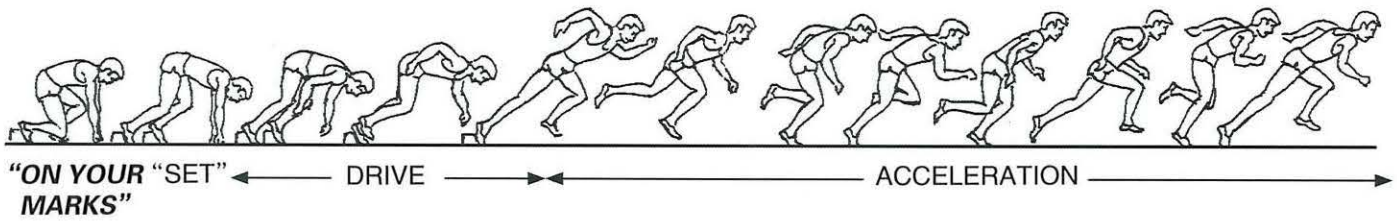


Crouch Start - Whole Sequence

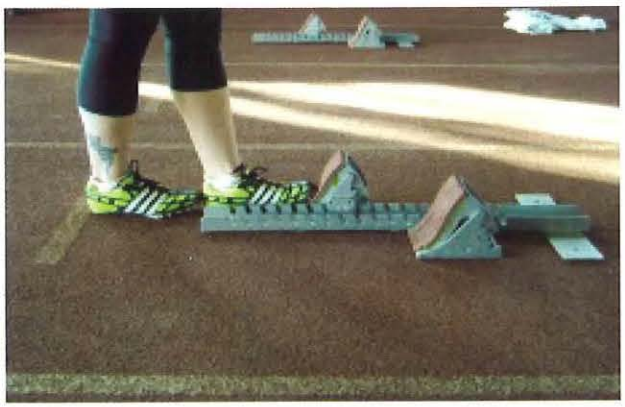
Phase Description

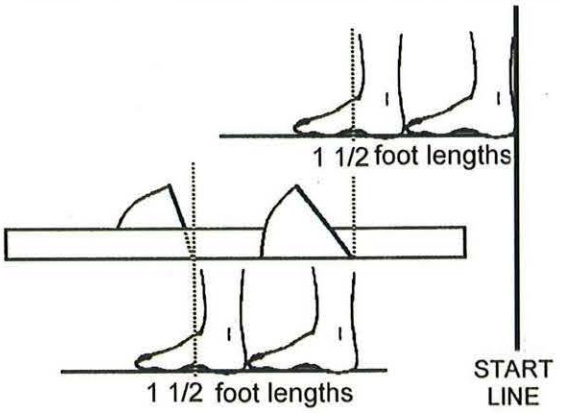
The Crouch Start is divided into four phases: "ON YOUR MARKS" position, "SET" position, DRIVE and ACCELERATION.

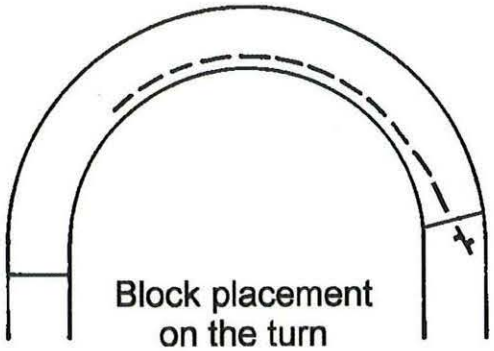
- In the "on your marks" position the sprinter has set the blocks and assumed the initial position.
- In the "set" position the sprinter has moved to an optimal starting position.
- In the drive phase the sprinter leaves the blocks and takes the first strides.
- In the acceleration phase the sprinter increases speed and makes the transition to the running action.



BLOCK PLACEMENT AND ADJUSTMENT





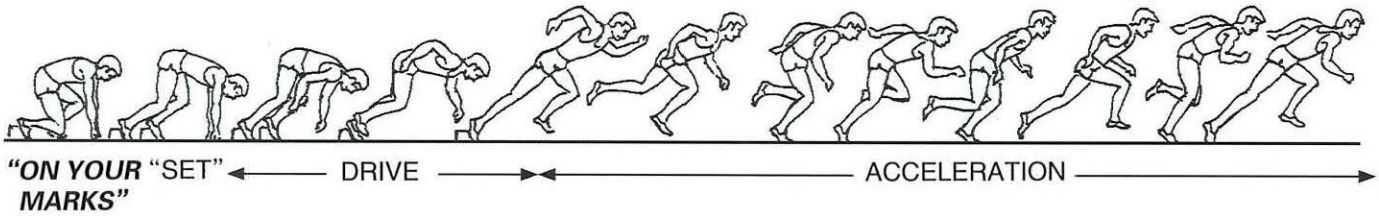


Objective

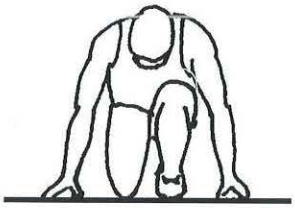
To set the starting blocks to suit the sprinter's size and ability.

Technical characteristics

- Front block is placed 1½ foot lengths behind the starting line.
- Rear block is placed 1½ foot lengths behind the front block.
- Front block is usually set flatter.
- Rear block is usually set steeper.



"ON YOUR MARKS" POSITION



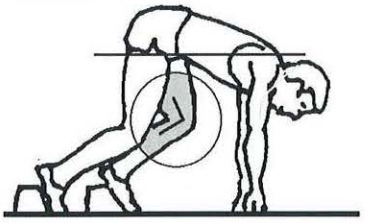
Objective

To assume an appropriate initial position.

Technical characteristics

- Both feet are in contact with the ground.
- Knee of the rear leg rests on the ground.
- Hands are placed on the ground, slightly more than shoulder–width apart, the fingers are arched.
- Head is in level with the back, eyes are looking straight down.

"SET" POSITION

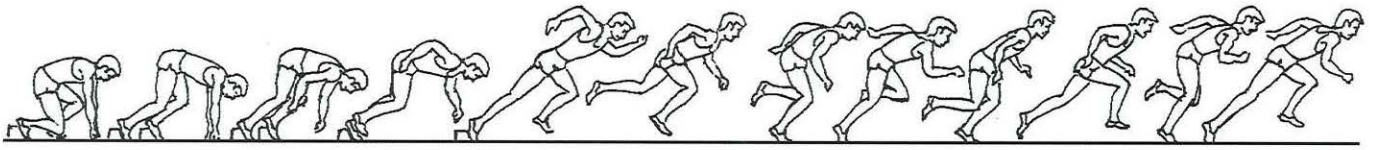


Objective

To move into and hold an optimal starting position.

Technical characteristics

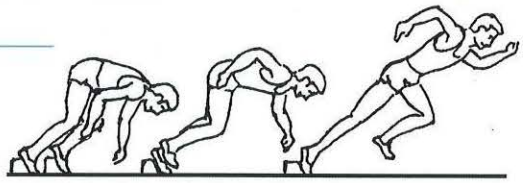
- Heels press backwards.
- Knee of the front leg is at a 90° angle.
- Knee of the rear leg is at a 120°–140° angle.
- Hips are slightly higher than the shoulders, the trunk is inclined forward.
- Shoulders are slightly ahead of the hands.



"ON YOUR "SET" ← DRIVE → ← ACCELERATION →
MARKS"

DRIVE PHASE

Objective



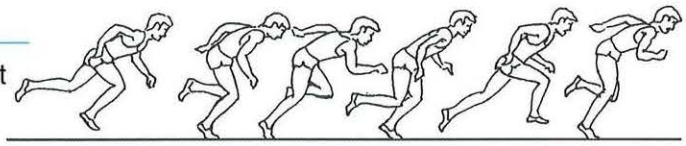
To leave the blocks and to prepare for the first stride.

Technical characteristics

- Trunk straightens and lifts as both feet press hard against the blocks.
- Hands lift from the ground together then swing alternately.
- Push of the rear leg is hard/short, the front leg's push is a little less hard but longer.
- Rear leg moves forwards rapidly while the body leans forwards.
- Knee and hip are extended during the drive.

ACCELERATION PHASE

Objective

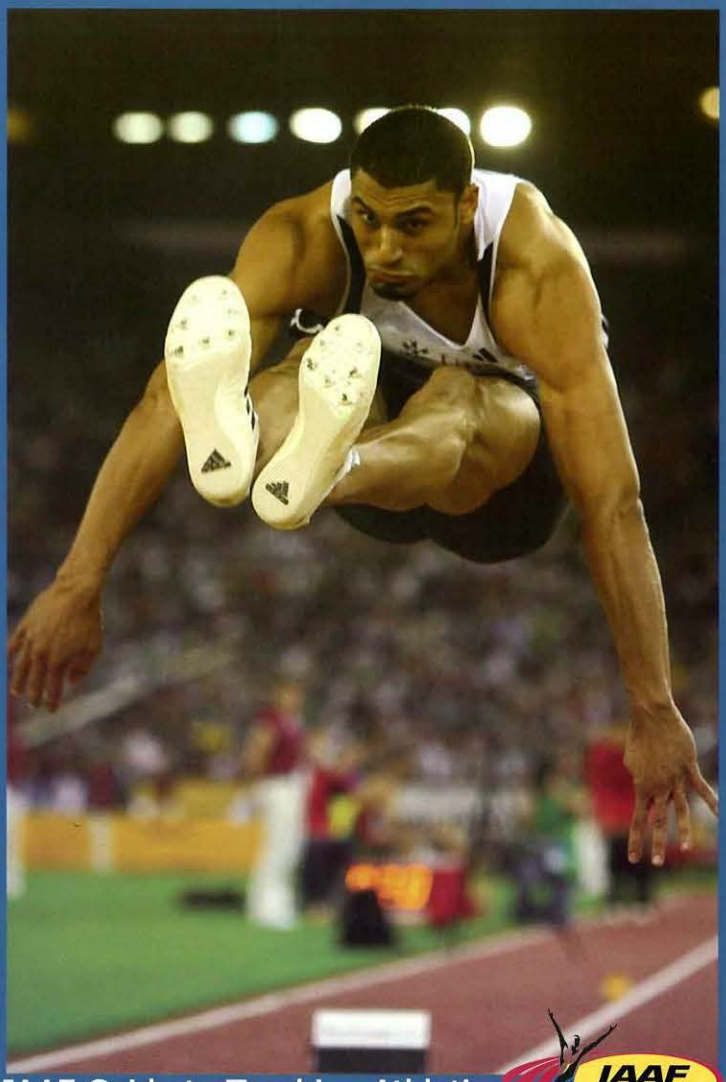


To increase velocity and to make an efficient transition to the sprinting action.

Technical characteristics

- Front foot is placed quickly onto the ball of the foot for the first stride.
- Forward lean is maintained. Lower legs are kept parallel to the ground during recovery.
- Stride length and stride frequency increase with each stride.
- Trunk straightens gradually after 20–30m.

跳 远
LONG JUMP



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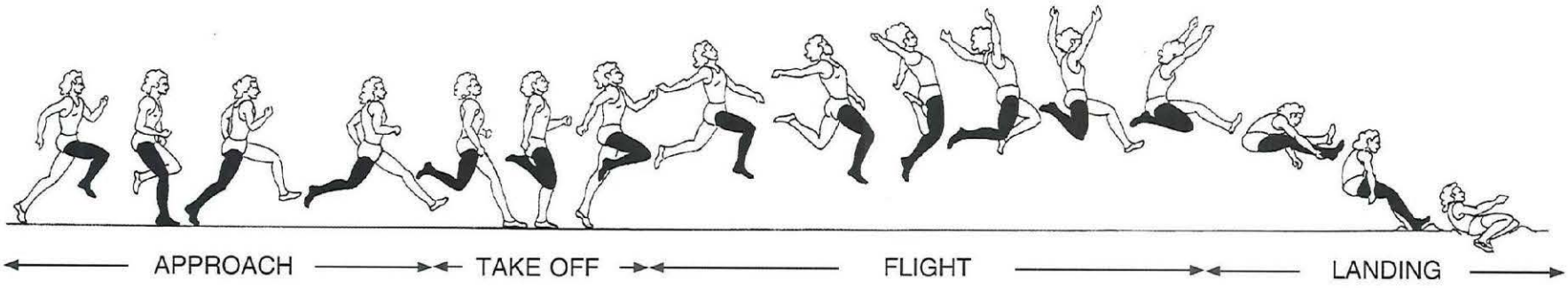
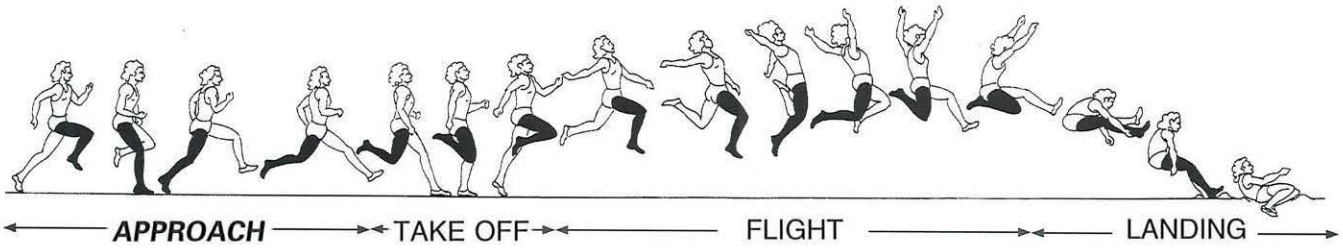


LONG JUMP – WHOLE SEQUENCE

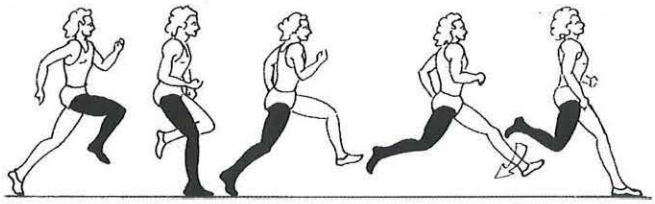
Phase Description

The long jump is divided into the following phases: APPROACH, TAKE OFF, FLIGHT and LANDING.

- In the approach phase the jumper accelerates to maximum controllable speed.
- In the take off phase the jumper generates vertical velocity and minimises the loss of horizontal velocity.
- In the flight phase the jumper prepares for landing. Three different techniques can be used: sail, hang and hitch–kick.
- In the landing phase the jumper maximises the potential distance of the flight path and minimises the loss of distance at the touchdown.



APPROACH PHASE



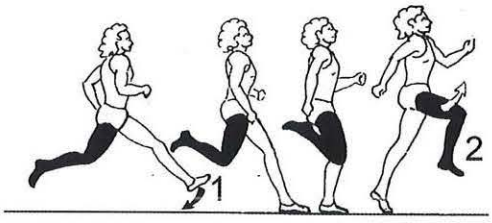
Objective

To achieve maximum controllable speed.

Technical characteristics

- Approach length varies between 10 strides (for beginners) and more than 20 strides (for experienced, elite jumpers).
- Running technique is similar to sprinting. Speed increases continuously until the take off board.

TAKE OFF PHASE

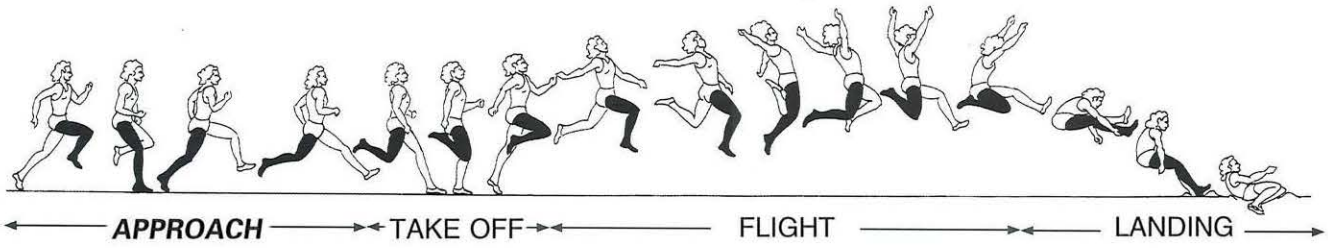


Objective

To maximise vertical velocity and to minimise loss in horizontal velocity.

Technical characteristics

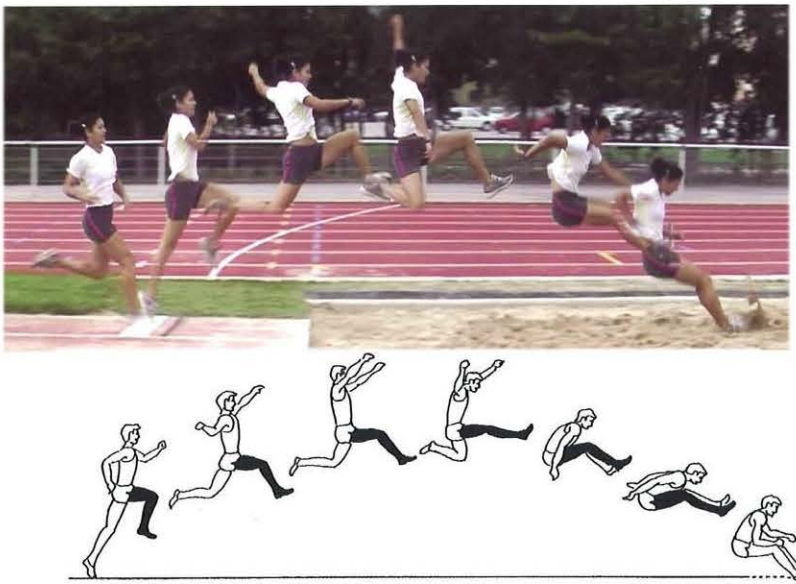
- Foot plant is active and quick with a 'down and back' motion. (1)
- Take off time is minimised, minimum bending of the take off leg.
- Thigh of the free leg is driven to the horizontal position. (2)
- Ankle, knee and hip joints are fully extended.



FLIGHT PHASE

Objective

To prepare for an efficient landing.



Sail Technique

Technical characteristics

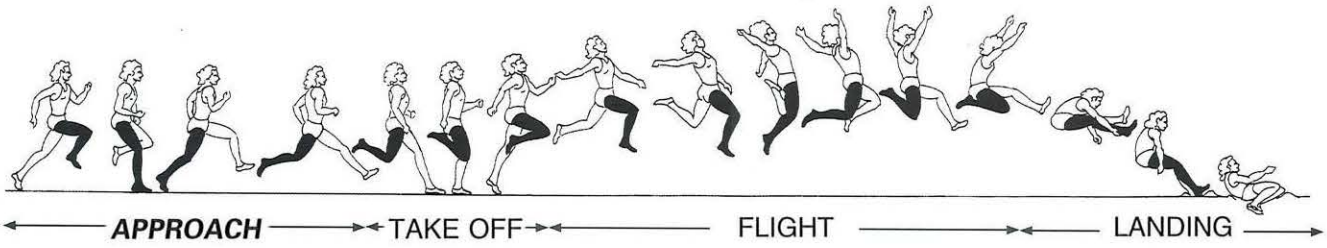
- Free leg is held in the take off position.
- Trunk remains upright and vertical.
- Take off leg trails during most of the flight.
- Take off leg is bent and drawn forwards and upwards near the end of the flight.
- Both legs are extended forwards for landing.

Hang Technique

Technical characteristics

- Free leg is lowered by rotating at the hip joint.
- Hips are pushed forwards.
- Take off leg is parallel to the free leg.
- Arms are in an upward–backward position.

Good technique especially for jumpers in the 6 –7 metres range

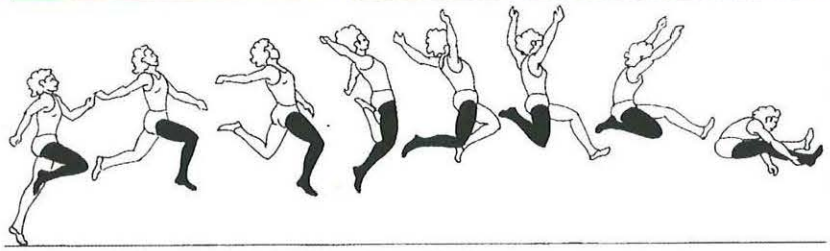


FLIGHT PHASE

Hitch–kick Technique

Objective

To prepare for an efficient landing.



Advanced technique for elite jumpers

Technical characteristics

- Running action continues in the air supported by arm swing.
- Stride rhythm of the approach should not be changed.
- Running action must be finished at landing, with both legs extended forward.
- Variations: $1\frac{1}{2}$ or $2\frac{1}{2}$ or $3\frac{1}{2}$ strides during the flight.

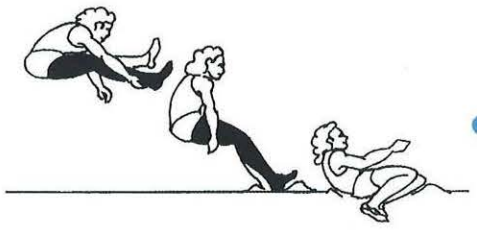
LANDING PHASE

Objective

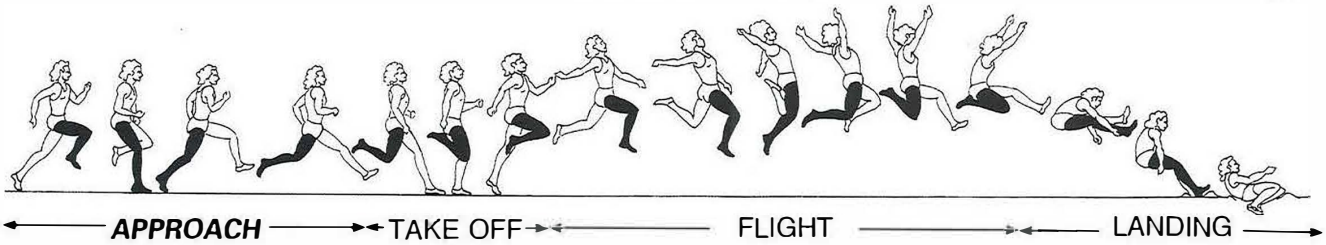
To minimise the loss of distance.

Technical characteristics

- Legs are almost fully extended.
- Trunk is bent forward.
- Arms are drawn backwards.



- Hips are pushed forwards toward the touchdown point.



Essential long jump rules

1) The width of the approach race should not be less than 1.22 m with no limitation on length.
2) **The preparation time limit before attempt jumping is 60 seconds.**
3) The wind gauge is placed alongside the jump runway 20m from the take-off board, wind speed is measured within 5 seconds. If the wind is stronger than 2m per second, the world record cannot be set.
4) Any athlete stepping beyond the take-off line is deemed to have failed at that attempt.
5) An athlete's jump is measured from the take-off board to the nearest mark in the sand. If any mark is made outside the take-off board, the jump will be considered invalid.
6) When measuring the length of jump, the mark in the sand should be measured perpendicular to the take-off line.

滑步推铅球
SHOT PUT – LINEAR

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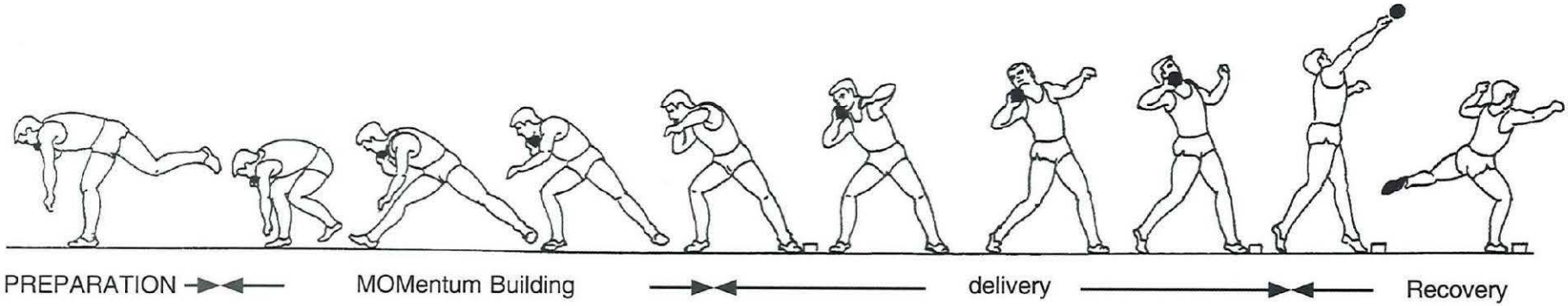
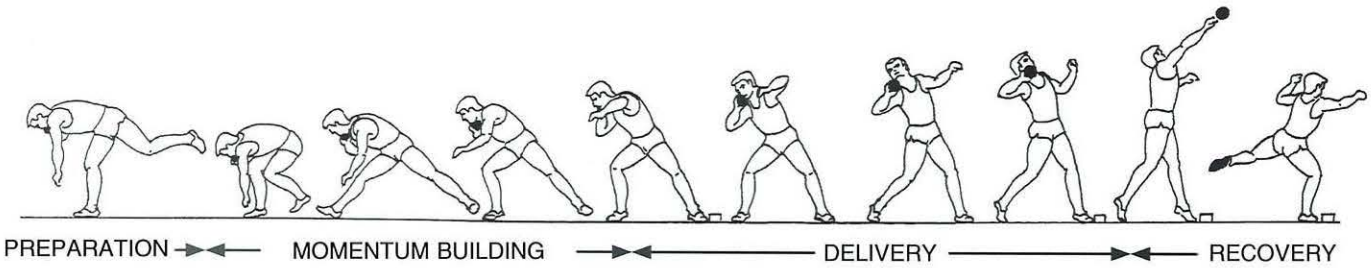


SHOT PUT LINEAR TECHNIQUE – Whole Sequence

Phase Description

- In the preparation phase the thrower is positioned for the start of the glide, the momentum building phase.
- In the momentum building phase the thrower and the shot are accelerated as the thrower prepares for the delivery phase.
- In the delivery phase additional velocity is produced and transferred to the shot before it is released.
- In the recovery phase the thrower braces and avoids fouling.



GRIP

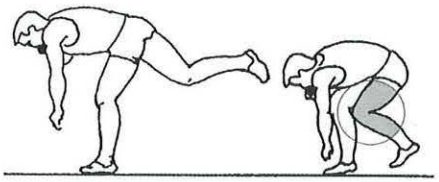
Objective

To hold the shot firmly.

Technical characteristics

- Shot rests on the fingers and the base of the fingers.
- Fingers are parallel and slightly spread.
- Shot is placed at the front part of the neck, the thumb on the collarbone.
- Elbow is out at a 45° angle to the body.

PREPARATION PHASE

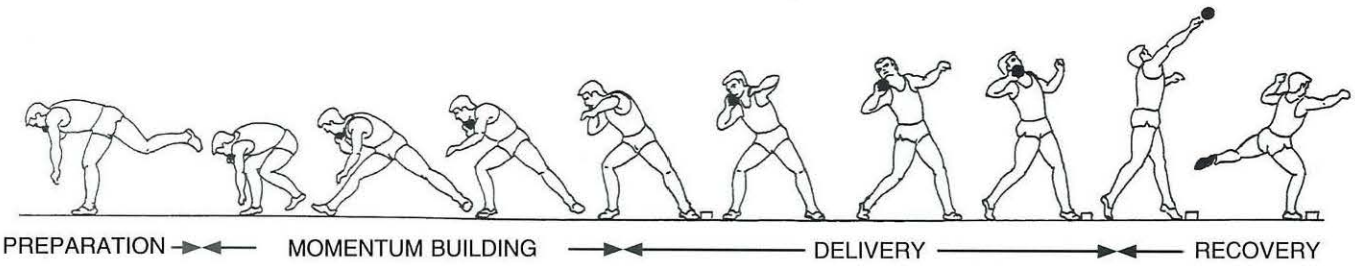


Objective

To prepare for the glide.

Technical characteristics

- Thrower starts upright at the rear of the circle with back to the stopboard.
- Trunk is bent forward parallel to the ground.
- Body is balanced in the single support.
- Support leg is bent while the free leg is drawn towards the back of the circle.



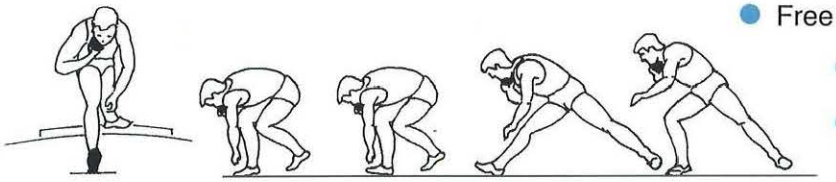
MOMENTUM BUILDING OR GLIDE PHASE

Objective

To initiate acceleration and position the body for the final putting action.

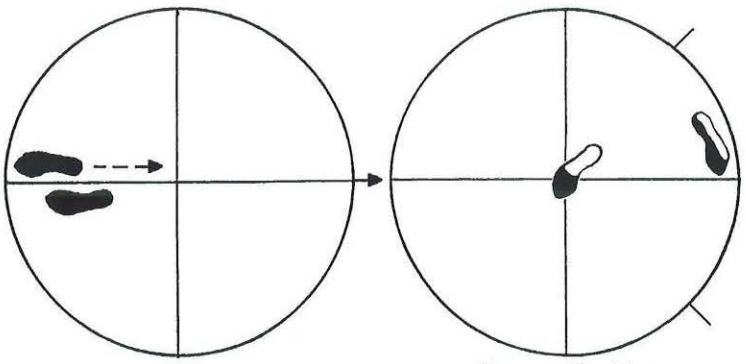
Technical characteristics

- Body moves from the forefoot on to the right heel, unseating the hips.
- Free leg is driven low towards the stopboard.
- Support leg extends over its heel.
- Support leg maintains ground contact through most of the glide.
- Shoulders are kept square to the rear of the circle.



GLIDE PHASE

Foot Placement



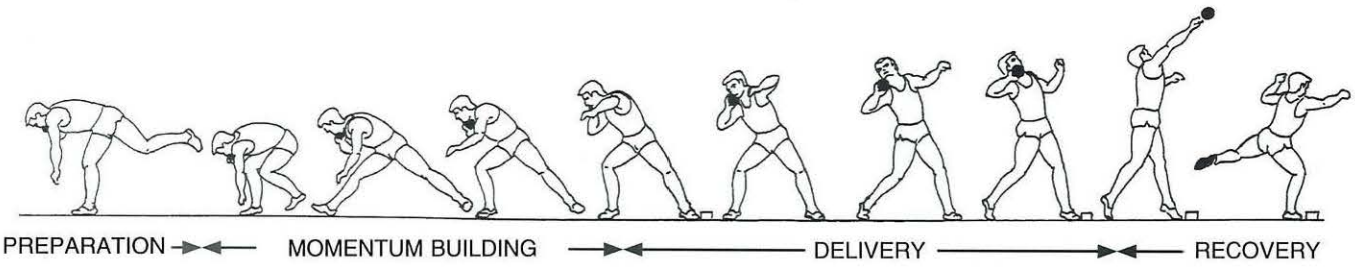
Power Position

Objective

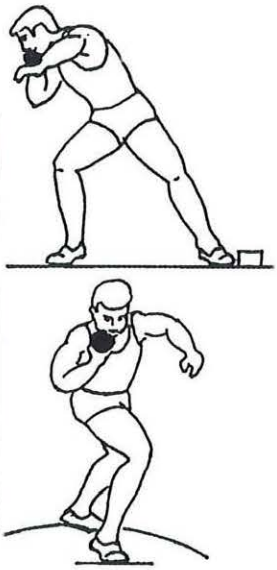
To initiate acceleration and position the body for the final putting action.

Technical characteristics

- Right foot glides off its heel and lands on the ball of the foot.
- Right foot is placed in the centre of the circle.
- Left foot lands on the ball and inside of the foot.
- Feet land almost simultaneously, right foot first.
- The delivery phase begins when both feet land on the ground after the glide.



DELIVERY PHASE



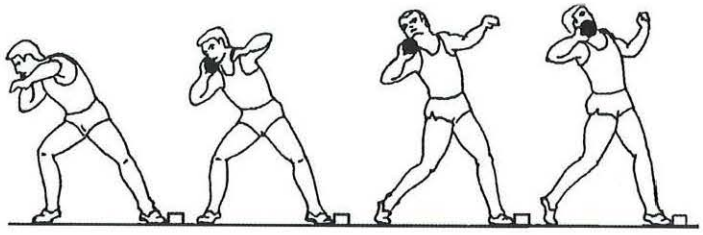
Part 1: Power Position

Objective

To maintain the speed of the shot and begin its main acceleration.

Technical characteristics

- Body weight is carried on the ball of the right foot, right knee is bent.
- Heel of the right foot and the toe of the left foot are placed in line ('Heel–Toe Position').
- Hips and shoulders are twisted.
- Head and left arm locked back.
- Right elbow is at approx. 90° angle to the trunk.



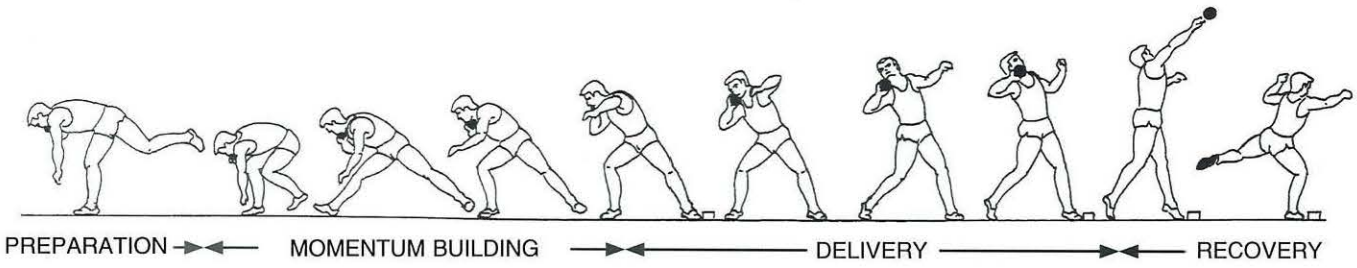
Part 2: Main Acceleration

Objective

To transfer velocity from the thrower to the shot.

Technical characteristics

- Right leg is extended in an explosive twisting movement until the right hip faces the front of circle.
- Left leg is almost extended and braced, lifting the body (and influencing the angle of release).
- Trunk's twisting movement is blocked by the left arm and shoulder.
- Right elbow is turned and raised in the direction of the throw.
- Body weight is transferred from the right leg to the left.



DELIVERY PHASE

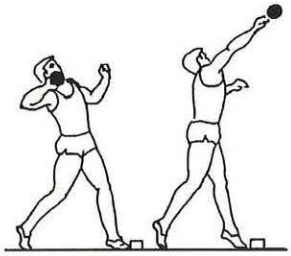
Part 3: Final Arm Movement

Objective

To transfer velocity from the thrower to the shot.

Technical characteristics

- Strike of the putting arm begins after full extension of the legs and trunk.
- Left arm is bent and fixed close to the trunk.

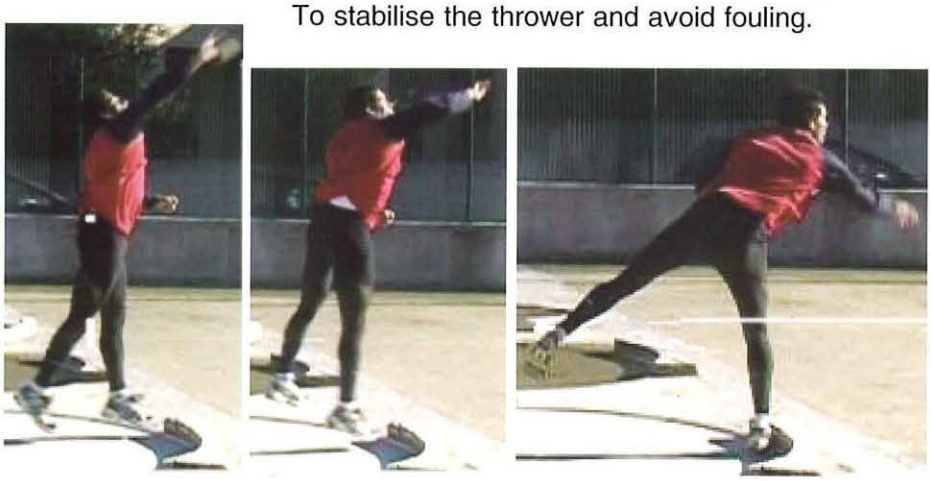


- Acceleration is continued by the pre-stretched wrist (thumbs down, fingers turning out after the release).
- Feet are in contact with the ground for the release.
- Head is behind the left (bracing) foot until the release.

RECOVERY PHASE

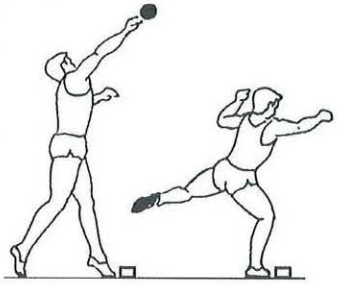
Objective

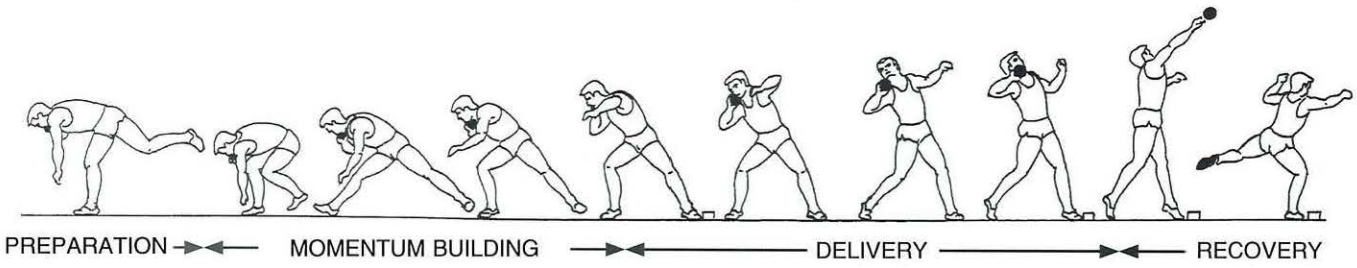
To stabilise the thrower and avoid fouling.



Technical characteristics

- Legs change quickly after the release.
- The right leg is bent.
- Upper body is lowered.
- Left leg swings backwards.
- Eyes look down.



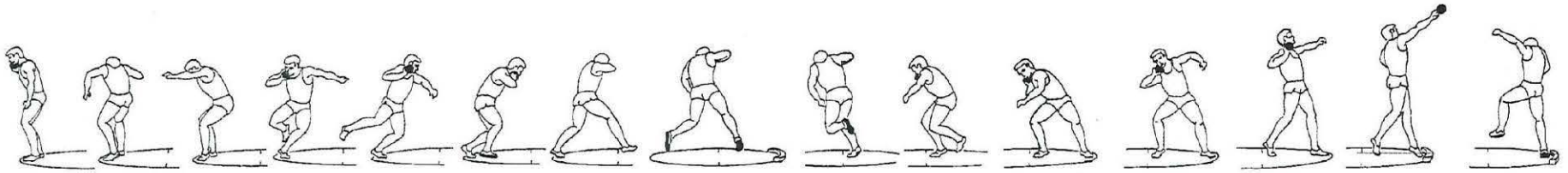


Essential shot put rules

1) The shot is thrown from a circle measures 2.135 m diameter. Athlete is permitted to touch the stop board.
2) The shot can be only hold by one hand.
3) During the whole putting action, the shot should be maintained in the level of the chin resting on the shoulder.
4) Athlete should not hold the shot behind or in front of the shoulder.
5) The shot should be pushed inside the circle.
6) When measuring length of the shot, 0.01 m is the minimum unit, distance less than 1 cm is not counted.
7) An athlete's shot is measured from the circle to the nearest mark in the landing area.
8) In shot put, thrower can touch the inner part of the stop board.

旋转推铅球
SHOT PUT – ROTATIONAL

Credit: RUN! JUMP! THROW! The official IAAF Guide to Teaching Athletics



PREPARATION → ← MOMENTUM BUILDING → ← DELIVERY → ← RECOVERY

SHOT PUT ROTATIONAL TECHNIQUE
Whole Sequence

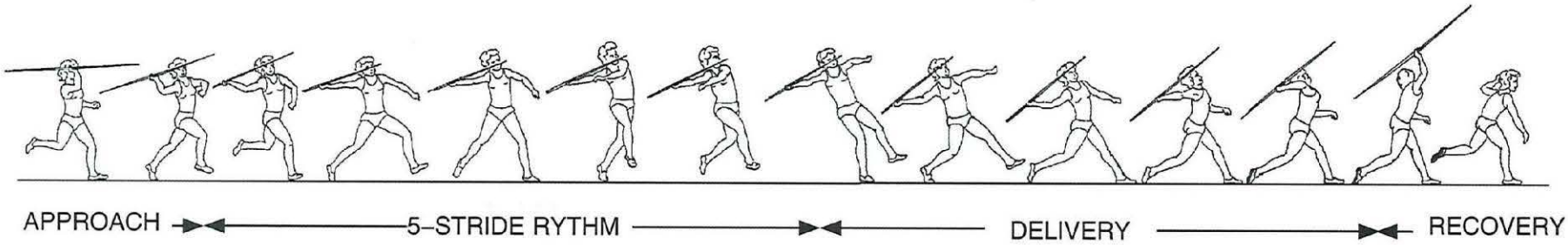
Phase Description

The Rotational Shot Put Technique is divided into four phases: PREPARATION, MOMENTUM BUILDING, DELIVERY and RECOVERY.

- In the preparation phase the thrower moves to the optimum position to begin the turn and pre–tension is built up.
- In the momentum building phase the shot is accelerated as the thrower moves to the optimum position for delivery.
- In the delivery phase additional velocity is produced and transferred to the shot before it is released.
- In the recovery phase the thrower avoids fouling.

掷 标 枪
JAVELIN THROW

Credit: RUN! JUMP! THROW! The official IAAF Guide to Teaching Athletics

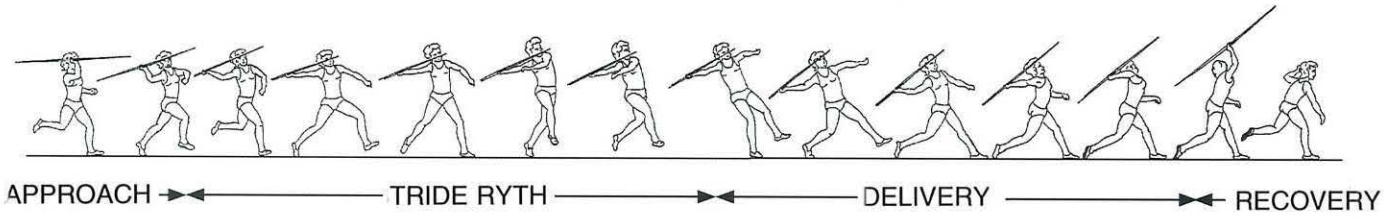


JAVELIN THROW – WHOLE SEQUENCE

Phase Description

The javelin throw is divided into the following phases:
APPROACH, 5–STRIDE RHYTHM, DELIVERY (which is part of the 5–stride rhythm) and RECOVERY.

- In the approach phase the thrower and javelin are accelerated.
- In the 5–stride rhythm phase they are accelerated further as the thrower prepares for the delivery phase.
- In the delivery phase additional velocity is produced and transferred to the javelin before it is released.
- In the recovery phase the thrower braces and avoids fouling.



GRIP

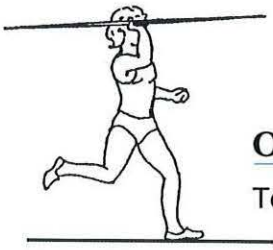
Objective

To grasp the javelin firmly and comfortably.

Technical characteristics

- Thumb and first finger grip (1), or
- Thumb and second finger grip. (2)
- Javelin lays diagonally in the hand.
- Palm faces upward.
- Grip hand is relaxed.

APPROACH PHASE

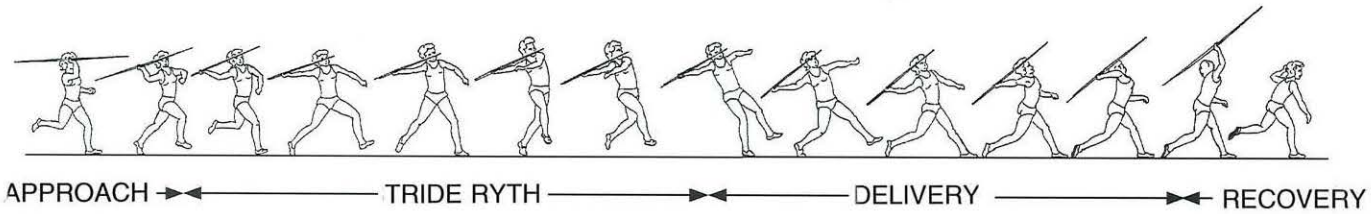


Objective

To accelerate the thrower and javelin.

Technical characteristics

- Javelin is held horizontally over the shoulder
- Top of the javelin is at head height.
- Arm is held steady (no forward or backward movement)
- Acceleration run is relaxed, controlled and rhythmic (6–12 strides)
- Acceleration to optimum speed, which is maintained or increased in the 5–stride rhythm.

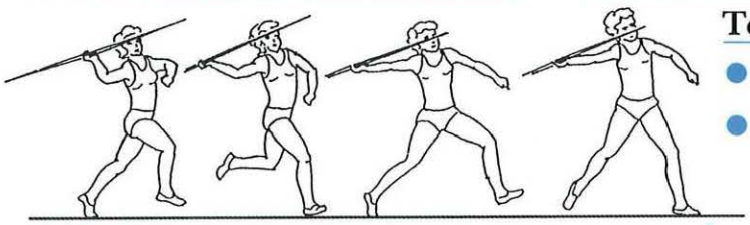


5–STRIDE RHYTHM PHASE

Withdrawal

Objective

To position the javelin correctly for the delivery.



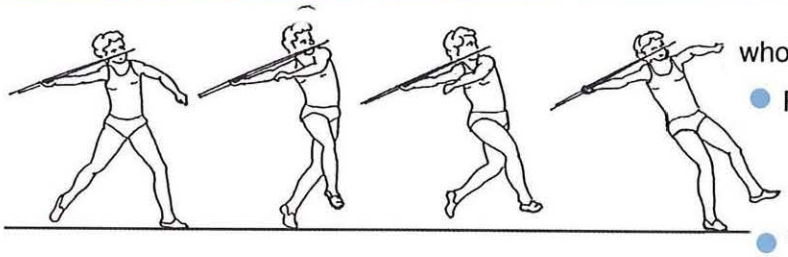
Technical characteristics

- Withdrawal starts on landing of the left foot.
- Left shoulder faces the direction of the throw, the left arm is held forward for balance.
- Throwing arm extends backwards during first and second strides.
- Tip of the javelin is close to the head.
- Throwing arm is at shoulder height or slightly higher after withdrawal.

Impulse Stride

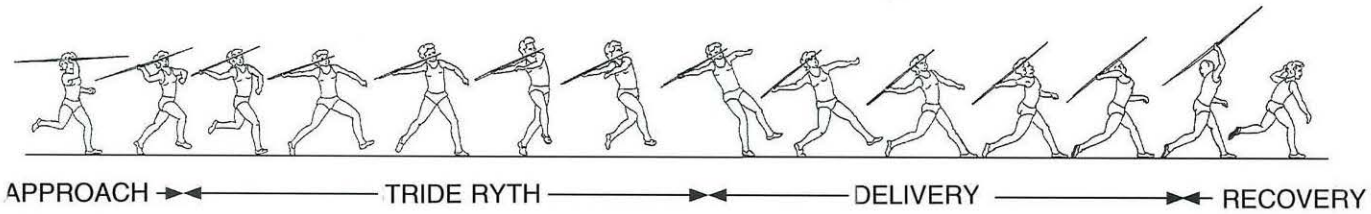
Objective

To position and prepare the body for the delivery.



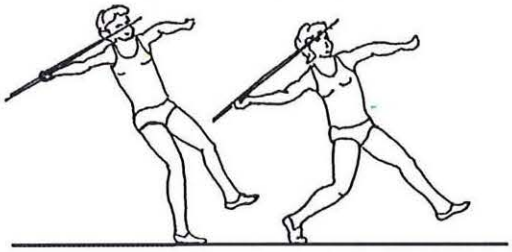
Technical characteristics

- Drive–off is active and flat from the whole sole of the left foot (no loss of velocity!).
- Right knee swings forwards (not upwards!).
- Body leans backwards: legs and trunk 'overtake' the javelin.
- Throwing arm and shoulder axis are parallel.
- Left shoulder and head face the direction of the throw.
- Impulse stride is longer than the delivery stride.



DELIVERY PHASE

Part 1: Transition



Objective

To transfer velocity from the legs to the trunk.

Technical characteristics

- Right foot is placed flat at an acute angle to the direction of the throw.
- Legs have overtaken the trunk.
- Axes of the shoulder, javelin and hip are parallel.
- Right knee and hip push forwards actively.
- Throwing arm remains extended.

Part 2: Power Position

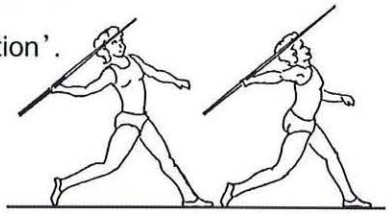
Objective

To transfer velocity from the trunk to the shoulder and arm.

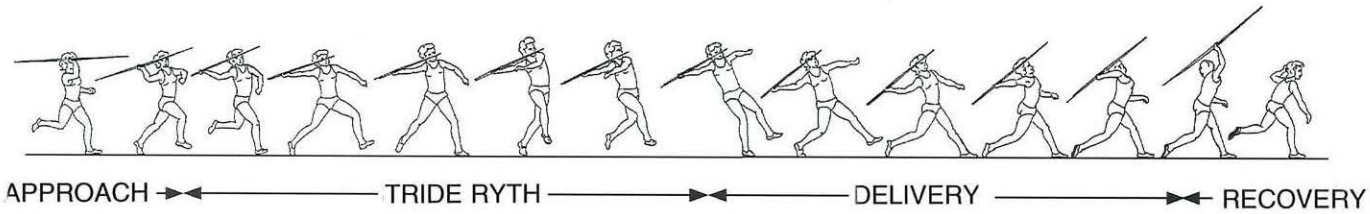
Technical characteristics

- Placement of left foot is active and solid.
- Left side is stabilised.
- Trunk is raised and there is a turning movement around the left leg.

- Muscles in the front of the body are highly pretensed in the 'Arc Position'.
- Throwing shoulder pushes forwards.
- Throwing elbow turns inwards, palm remains up.

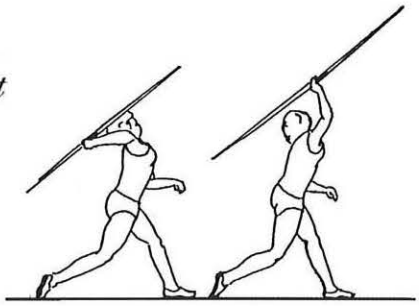


Power Position *Arc Position*



DELIVERY PHASE

Part 3: Final Arm Movement

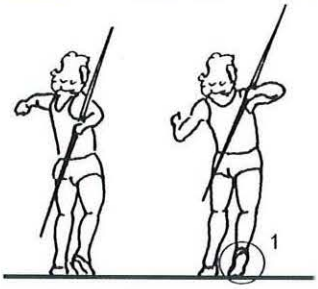


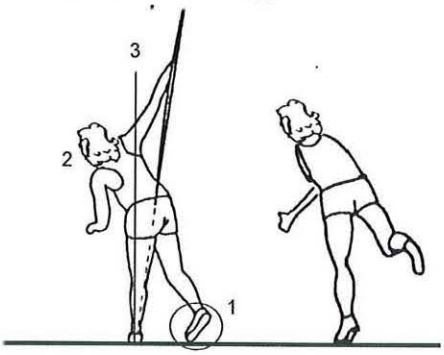
Objective

To transfer velocity from the shoulder and arm to the javelin.

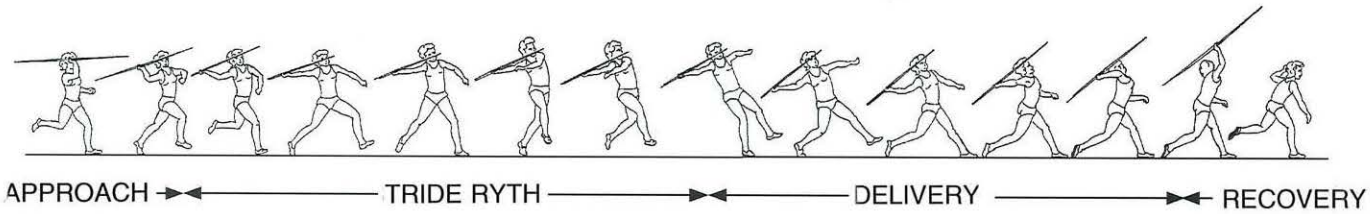
Technical characteristics

- Right elbow draws forwards and upwards alongside the head. Trunk moves forwards.
- Throwing elbow straightens explosively.
- Left side of the body is blocked by a solid left leg and the fixing of the bent left elbow close to the trunk.
- Right foot maintains ground contact until the javelin is released.



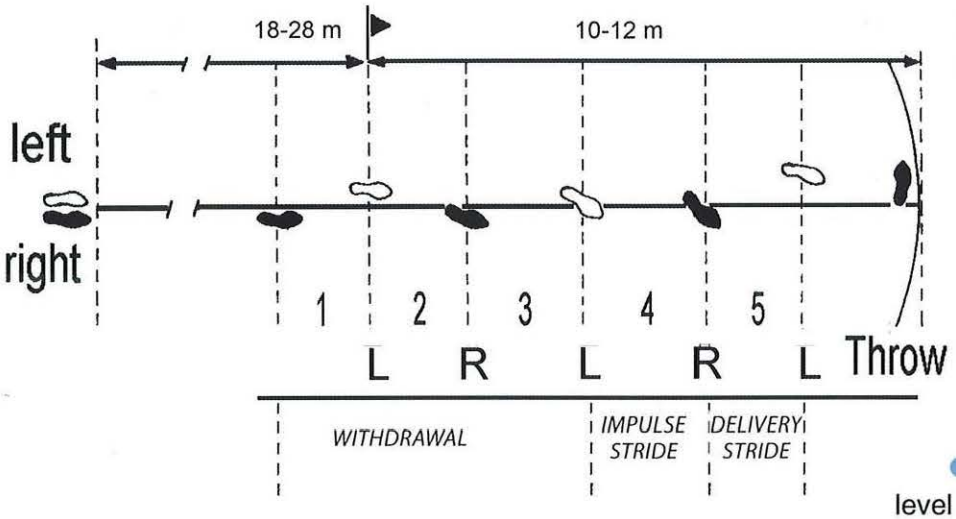


- Right foot turns on its outside edge and is dragged behind. (1)
- Trunk leans slightly to the left, the right shoulder is directly over the left foot. (2) (3)
- Throwing arm should be as close to vertical as possible at release. (3)



5–STRIDE RHYTHM PHASE

Foot Placement



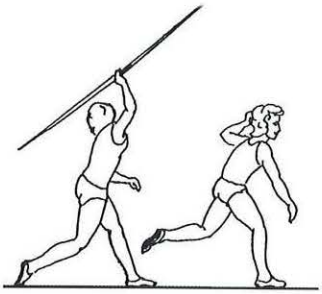
Objective

To create velocity and transfer it to the javelin.

Technical characteristics

- 5–stride rhythm comprises:
  - the withdrawal
  - the impulse stride
  - the delivery
- Speed increased to optimum level (based on individual capability).

RECOVERY PHASE

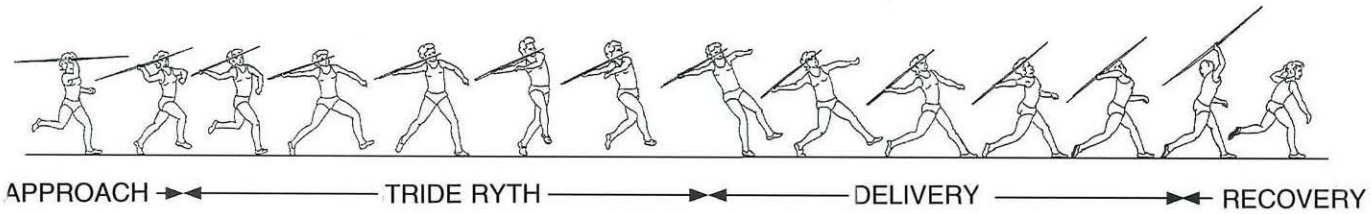


Objective

To stop the forward movement of the body and avoid fouling.

Technical characteristics

- Legs are reversed quickly after the release.
- Right is leg bent. Left eg swings backwards.
- Upper body is lowered.
- Distance from the foot of the brace leg to the foul line is 1.5 – 2.0 m.



Essential javelin rules

1) When throwing, the javelin should be released high over the shoulder.
2) The rotational movement is not allowed
3) The javelin must land point first for a throw to be valid.
4) The athlete faces the landing area at all times.
5) The javelin can not be re-equipped.
6) The minimum length of the runway shall be 30m.
7) Athlete has to wait in the assigned area beforehand.
8) The diameter of the pointed head should not larger than the diameter of the body part of the javelin for 80%. An athlete leaves the runway the first contact with the parallel lines or the ground outside the runway shall be completely behind the white line of the arc at right angles to the parallel lines.

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Related websites:

國際田徑聯會(IAAF)

http://www.iaaf.org/

中國田徑協會

http://athletic.sport.org.cn/

香港業餘田徑總會

http://www.hkaaa.com/

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