

Coaching the Long Jump  
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The long jump is a power event that comprises of the following four phases:

- Approach run up
- Take off
- Flight through the air
- Landing

To achieve maximum distance in the long jump the athlete will have to balance three components - speed, technique and strength.

### **The approach run up**

The objective of the approach run is for the athlete to achieve the ideal speed. Rhythm in the approach run is important to ensure the ideal speed is achieved at take off and accuracy in hitting the take off board. It is important the athlete develops a good running rhythm before accuracy is addressed. The length of the run will depend on the athlete's age and speed. When first determining the number of strides in the approach run start by matching the number of stride with the athlete's age;

Age	Strides
Under 11	10-12
Under 13	12-14
Under 15	14-16
Under 17	16-18
Over 17	18-22

The start of the approach run should be marked and the athlete should commence the start from a standing start. Some athletes use a 'walk on start' or 'run on start' that will provide more initial speed but if not consistent will impact the accuracy of the approach run onto the take off board. The athlete begins the run with a marked forward lean to develop speed but before they reach the take off board, they should be upright. The athlete should be on the balls of the feet as in sprinting with a natural head position, the eyes focused beyond the pit and not at the take off board.

Accuracy of the approach run onto the take off board is established by:

- Determine the take off foot
- Stand with your back to the jumping pit and the heel of your non take off foot on the take off board scratch line
- Run up the runway the required number of strides, say 18, and place a marker where the 18th stride falls
- Place the **take off foot** on the marker and run back towards the board and take off. The coach should note where the 16th (or whatever yours it) stride lands in relationship to the take off board.
- If the foot is behind the take off board, say 20cm, then move the start marker 20cm forward. If the foot is beyond the take off board then move the marker back
- Repeat the run up and marker adjustment 4 or 5 times to establish a consistent approach run onto the take off board
- Once achieved measure the distance accurately and record it for future use
- It is important to bear in mind that a head or tail wind will affect the run up. A head wind may mean moving the marker slightly forward

### **Ideal Speed**

Dr. Philip Graham-Smith of the University of Salford (UK) and Professor Adrian Lees of the John Moores University Liverpool (UK) have identified algorithms that will predict an average distance that an athlete would be expected to jump for a given speed. These algorithms are based on official approach speeds and distances collected over a period of ten years from junior and senior championships and Grand Prix events.

- Male - distance = (speed in m/s x 0.95) - 2.23
- Female - distance = (speed in m/s x 0.99) - 2.81

The speed, in metres/second (m/s), can be determined by timing the athlete between two markers set at 11 metres and 1 metre from the take off board.

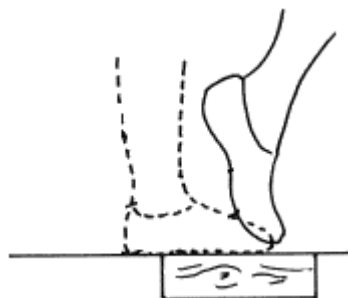
## The take off

The preparation for the long jump take-off begins in the later phases of the approach run. The long jumper prepares for take off by sinking the hips and then raising the hips into the take off phase. This usually results in the next to last stride being longer than normal and the final stride being up to 25 centimetres shorter than a normal running stride. It must be emphasised that the hip sink and stride adjustment all happen in response to the athlete's postural adjustments in preparation for the take off. At take off ensure the hips are slightly forward of the shoulders.

When the take off foot is placed on the board, it is slightly in advance of the jumper's hips and should strike the board on the mid line.



The final two foot supports in the take off should be flat, almost slapping contacts.



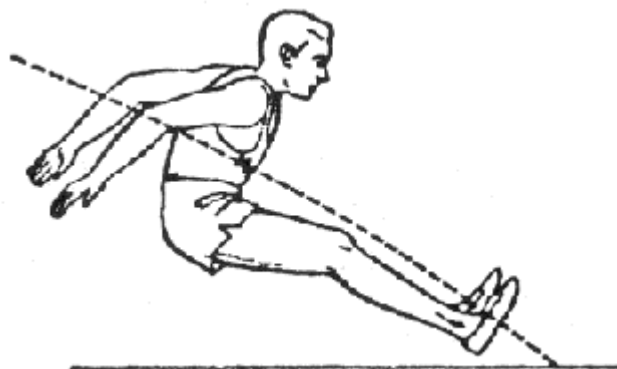
The vertical impulse is achieved by the upward acceleration of the "free" limbs, the arms and the non take off leg, against the braced take off leg. These movements should be characterized by short radius (blocked), fast explosive actions. The head should be carried in a normal position, in line with spine, and the eyes should be focused forward and slightly up.

## The flight through the air

Speed and lift generated on the runway and through take off can result in a good distance. After a take off the athlete tends to have forward rotation that, if not corrected, will result in the feet hitting the sand early and a loss of distance in the jump. The cyclic forward movement of the legs and arms, as seen in the hitch-kick for example, will correct this forward rotation.

## The landing

During the landing, the athlete is aiming to get the heels as far away from the take off board as is possible. The ideal landing position is shown in the diagram opposite where the dotted line represents the projected flight path of the body's centre of gravity. The heels will need to land just before the projected flight path to ensure the athlete does not fall back into the sand. As the feet make contact with the sand, press the heels downwards and contract the hamstrings causing the hips to rise. As the hips rise twist them to one side and allow the forward momentum to carry the body past the landing position.



## Optimum take off angle

The take off speed of a male elite long jumper is about 10.5 metres/second in a "run through" (take off angle of zero degrees) and 3.5 metres/second for a vertical jump (take off angle of 90 degrees). This decrease in speed means that the optimum angle of take off is well below 45 degrees. For the elite long jumper the optimum take off angle is between 18 and 25 degrees (Linthorne et al, 2001)

## Long Jump Styles

### **The Stride Jump (or combination of Hitch/Hang)**

In the stride jump style the athlete maintains the take off position for as long as possible and only as the athlete comes into land does the take off leg join the free leg for a good landing position.



### **The Hang Style**

On take off the athlete drops the free leg to the vertical, which is then joined by the take off leg. The arms go overhead to slow down the rotation about the athlete's centre of gravity. The legs are then lifted upwards and forwards whilst lower the trunk. The arms swing past the legs during the landing phase to ensure a good leg shoot.



### **The Hitch-Kick**

Following take off the free leg is straightened and swung back and down as the take off leg folds up beneath the hips and comes forward bent. The take off leg then continues forward, straightening for landing. The free leg completes its backward swing behind the hip and then folds up and moves forwards bent, to join the take off leg ready for landing.



### **Evaluation Tests**

The following evaluation tests can be used to monitor the long jump athlete's development:

- 10 stride test
- 60 metre speed test
- Flying 30 metre speed test
- Jumps Decathlon
- Leg Elastic Strength test
- Standing Long Jump test
- Strength test - upper body (Bench Press)
- Strength test - lower body (Leg Press)
- Sit Ups test - abdominal strength
- Sit and Reach test - lower back and hamstring test
- Vertical Jump test

### **Associated Books**

The following books provide more information related to this topic:

- Long Jump, M. Arnold, ISBN 0 85134 086 5
- How to Teach the Jumps, D. Johnson, ISBN 0 85134 090 3
- Advanced Studies in Physical Education and Sport, P Beashel et al., ISBN 0 17 4482345
- Physical Education and the Study of Sport, B. Davis et al., ISBN 0 7234 31752
- Essentials of Exercise Physiology, W.D. McArdle et al., ISBN 0 683 30507 7
- Physical Education and Sport Studies, D. Roscoe et al., ISBN 1 901424 20 0
- The World of Sport Examined, P. Beashel et al., ISBN 0 17 438719 9
- Advanced PE for Edexcel, F. Galligan et al., ISBN 0 435 50643 9
- Examining Physical Education, K. Bizley, ISBN 0 435 50660 9
- Sport and PE, K Wesson et al., ISBN 0 340 683821

Website resource

<http://www.brianmac.co.uk/longjump/>

<http://www.coacheseducation.com>