High Jump From the Ground Up

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High Jump Basics

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Women's Track and Field

Who is an expert in Track and Field Coaching?

- Anyone from out of town!

Where I learned about high jump.

Dwight Stones – Jim Santos

World Record Holder 7' 7"

Who can be a high jumper?

- Javier Sotomayor, 6′ 5″
- Stefka Kostadinova, 5′ 11″
- Brian Urlacher, 6′ 4″
- Franklin Jacobs, 5′ 8″
  http://www.youtube.com/watch?v=DolBoQtFZxQ

High Jumped 7′ 7 ¼ " which is 59 cm (23.25 in) above his height)

How to Start a Beginner (Part 1)

To get your athletes comfortable with high jumping, have them simply take a few steps and scissor-kick over the bar, landing standing up. Make sure they push off with the outside leg, and raise the inside leg, closest to the bar. Make sure they also raise the trail leg to clear the bar.

Begin the drill without any type of bar, then add your rope, cord, or bar. The jumpers try this drill from both sides, to get a feel for which side they jump better. Allow them to take a longer run to jump over the bar. Hopefully, this will answer the question of which foot should be the take-off foot.

- If the athlete has been taking off on his/her left foot, then he/she will start from the right side as looking toward the pit.
- If the athlete has been taking off on his/her right foot, then he/she will start from the left side as looking toward the pit.
- Or, to say it differently, if the jumper's right foot is the inside foot, he'll begin his approach from the right side, and vice versa.

How to Start a Beginner (Part 2)

To start getting your jumpers comfortable with landing backward in the pit, have them stand facing away from the bar, with the "bar" (rope, cord, etc.) low, and have them jump over the rope and land on their backs. After a few repeats, ask them to try to arch their back slightly on the jump over the "bar."

You can add a box, or something to simulate them being higher in the air. Try to tell them not to jump straight back into the "bar," but up and over.

The Frog

- The bar should be significantly lower
- Regular approach
- Take-off, then turn backward to the bar and slap both knees(on the inside) with the hands

The Approach

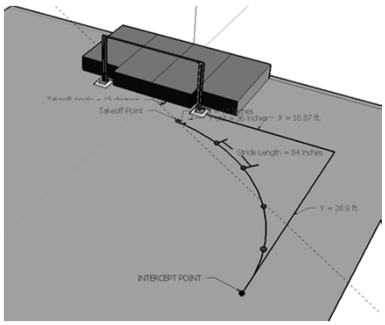
The Approach

It's the approach that generates the speed that gives a high jumper the power to leap over the bar. The approach must be controlled by employing the same stride pattern on each jump, in order to complete the approach at the proper takeoff spot. (Do you start the approach or walk into it?)

You begin by developing a consistent approach run, then learn the proper takeoff and flight techniques. Dwight Stones says that about 85% of the jump is done by takeoff—so that much time should be devoted to the approach in practice.

The Curve

J approach not C



The curve has two purposes:

- to make the athlete have a tilt away from the bar at the plant
- to lower the center of mass without having to flex the legs very much

How to Find the Curve

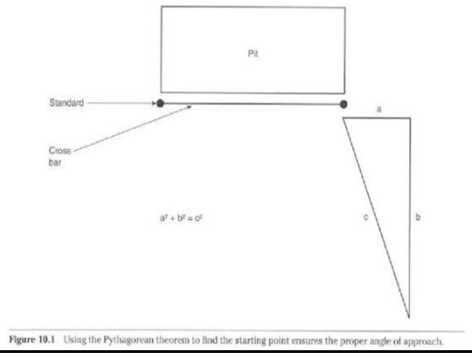


Figure 10.1 Using the Pythagorean theorem to find the starting point ensures the proper angle of approach.

Angle of the Curve

- Measure out from the correct standard
- Measure the straight part of the run
- Make sure of the 90 degree angle
- Find the take-off point
- Find the beginning part of the curve
- Measure the angle
- You could draw with chalk the actual angle (path) to the take-off point
- This chalk line cannot be used in competition

Number of Steps

- High jumpers generally employ a 9, 10, or 11 step approach
- 4, 5, or 6 steps in a straight line and five steps along an arc that curves toward the bar.
- The athlete will set a checkmark at his/her starting point and make a second mark at the transition point from straight to the curved part of the approach.

Rhythm and Intensity of the Approach

- American Record Holder's View based on a 10 step approach
- 3 groups of 3 and jump
- 1-2-3
- 1-2-3
- 1-2-3
- JUMP

The Lean

The inside foot is the first to move inward from the straight line, thereby initiating the turn. The jumper, by running this curve, generates centripetal force and will have to develop an inward lean to maintain the accelerated speed prior to takeoff. The narrower the turn radius, the greater the speed toward the bar.

Single Arm vs. Double Arm

- Either inside or outside arm only drives up
- Both arms drive up (funky chicken)
- Sit on the ground. Pull both arms behind your body, elbows bent at ninety degrees. Keeping them bent, swing your arms in front of your body and stop them abruptly when your triceps are parallel to the ground. Now your seat is no longer on the ground. This simulates the double arm block at the takeoff point in the high jump.

The Penultimate Step

- The penultimate step of the approach (in the case of a ten-step approach, the ninth) is slightly longer than any of the other steps. This longer step allows the athlete to lower the hips to place them in a more powerful position.
- Let the back shoulder stay back to start the turn over the bar

Just Before the Plant

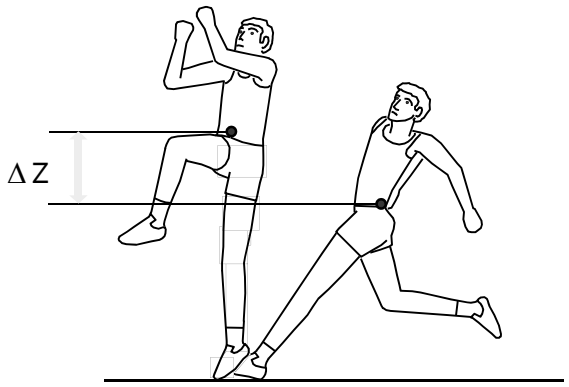
The Plant

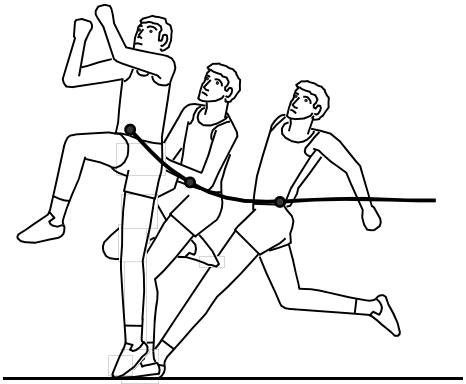
The Plant

- The final step should be the shortest, allowing the following actions to take place:
- To allow for a hip rise from the penultimate step to the last step
- To bring the trail leg through faster, since it is a shorter lever
- To place the jumper's center of mass directly over the takeoff foot sooner
- To create "quickness" off the ground

The Plant

- Inside knee and arm come slightly across the body
- Jump straight up—body will corkscrew on the way up
- Fast free leg
- Both arms and free knee moving together to maximize lift (vertical) forces
- Toe will stay on the ground the longest





Where to point the foot?

- Point the take-off foot toward the corner of the pit where the jumper is facing.
- A good take-off angle is 30 – 35 degrees.
- Do not try to place the foot parallel to the bar on take-off; below 30 degrees increases the risk of medial ankle injury.

What to look for in the plant

- Last two steps are: flat, flat.
- Look at the shin angle at the time of the penultimate contact is an expression of the body's orientation in the preparation for take-off. An angle of less than 90° is linked with a moderate forward lean, which complicates reaching the proper body position at the touchdown for take-off.

Shin Angle

Figure 1: Comparison of the shin angle of the same athlete in two competitions (2.34 m clearance and 2.27m foul jump)

Foot Plant Location

The basic rule for heights under 72 inches is that the takeoff will occur about an arm's length from the near standard. The distance of the foot plant from the standard or the cross bar is approximately 45 to 50 inches for heights of 72 inches or higher. This same general rule applies to women attempting to clear a cross bar over 69 inches.
The takeoff point should be directly out from the closest standard. Jumpers who take off too close to the bar will not be able to maintain momentum during bar clearance.

Lift Off

The free-leg swing and the arm drive must occur simultaneously to achieve a 90-degree angle at the moment of takeoff. This upward drive provides a downward force that creates an eccentric contraction, resulting in a greater force and velocity. Quickness off the ground is very important; the jumper who can apply the greatest force in the shortest period of time will achieve success. There should be a full body extension at take-off.

The flight path is known as the parabolic curve. Any movements made while not grounded- that is, movements made only in the air-will not alter the speed of rotation or the position of the body in relation to the center of mass. The ideal bar clearance is where the center of mass rises the least while the body clears the crossbar. Also, having both arms as close to the body and legs as short as possible will allow for faster rotational speed over the cross bar.

Inside Arm over the Bar

- Makes jumper lean into the bar
- Stops rotation of the body around the horizontal axis
- Drops the center of gravity into the bar
- Jumper that has jumped up and already over the bar, can bring arm over to help break the fall

Where to Look

Your head and your eyes will dictate what your hips do. If you are looking down at your feet or your steps, you certainly won't jump up in the air. If you are looking at the bar when you jump, you will run right into it. A high jumper's gaze should shift over the course of the approach and then the jump. It should start at the near standard.

When the jumper begins the curve of the J-run, their sight line should move with their shoulders and hips toward the middle of the bar, and as they get closer to the bar and their hips and should are turning more perpendicular to the bar, they should be seeing the far standard.

At the point of takeoff, the gaze of the high jumper should be parallel to the bar, not looking at any of the high jump apparatus but at something that could be along the line of the bar about twenty feet away. After the take off the high jumper should lean their head slightly back and try to look at something on the opposite side of the pit from the middle of the bar.

Over the Bar

Over the Bar

During the flight or layout position, the jumper's head can drop straight back for greater hip height when on top of the crossbar. The head can also look to the far corner of the mat. If the head stays forward, it will act as a blocking movement and not allow for the hips to rise to their maximum height.

The legs are bent at the knees to decrease their length by rotating outward while the heels are pulled in, thus increasing the speed of rotation over the crossbar. The wider or shorter the legs can become, the shorter the lever, and thus, the faster the rotation over the bar. (Remember The Frog)

Ultimate Bar Clearance

The jumper has achieved the best possible bar clearance when the hips have cleared, the head is as low as possible, and when the layout position is completed.

The Landing

Landing

The jumper will now pull the chin to the chest, which causes a simple bend of the hips to bring the legs and feet up, and the body will form into a V to assist in the clearance of the legs. The jumper should land in the pit on the middle to upper back with arms and legs extended to the front . The athlete does not want to land on the base of the neck for obvious reasons.

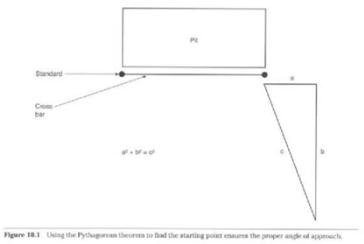
Where to Land

The jumper should land toward the middle of the pit (not on the end) on the middle to upper back with arms and legs extended to the front . The athlete does not want to land on the base of the neck for obvious reasons.

How to correctly measure from the start of the approach to the takeoff

- Start from the inside of the close standard from where the jumper begins.
- Measure straight out from that standard.
- Turn 90 degrees and Measure out to starting point of the run up/approach. (T-square).
- This gives you 2 numbers—wide and out.

How to Measure Approach



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Sample High Jump Workouts

- Circle cone drills
- 3-4 step jumps
- 5-6 step jumps
- Lower height form jumping
- Meet preparation jumping
- Dwight Stones "10" good jumps
- One inch above highest jump

High Jump Necessities

- fast run-up
- low hips at end of run-up
- strong arm and lead leg actions during takeoff
- generate appropriate angular momentum
- body vertical at end of takeoff

Where to stand to watch/coach

- Stand slightly away from jumper's chosen approach side but toward middle of apron.
- Stand directly in line from jumper's run up straight line—10-15 feet behind line of crossbar.
- Stand directly in line with crossbar away from jumper's path.
- Stand directly behind jumper 5-10 feet from start of run up/approach.

Possible reasons for a bad bar clearance:

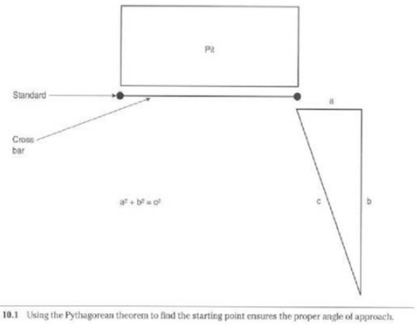
- insufficient angular momentum
- insufficient arching
- bad timing of arching/un-arching
- height not achieved above bar
- Approach puts take-off on incorrect spot—i.e. running the route backward to find starting spot.

Advanced High Jump

How to correctly measure from the start of the approach to the takeoff

- For exact place, use one long tape, and record 3 numbers: 0 at standard; # at wide; # at run up point; and # back to standard. You can measure a rope/string with colors for the numbers. It will be a circle, since it will be attached back at the standard. After you set the rope/string at the standard and then the wide number, pull the remainder of the rope/string out to form a right triangle. This will find your starting point.

Exact Measurement for Start



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Thoughts for the Day

We are what we repeatedly do.
Excellence, then, is not an act, but a habit.
-- Aristotle

The Body achieves what the Mind Believes!

Pre-Competition Ritual

- Must be same every time (food, warm-up, etc.)
- Only perfect practice makes perfect
- Practice only makes permanent
- NJCAA and NCAA do not allow electronic devices on the competition field
- If your jumper is hyper, then have them listen to "Baroque" style of music like Mozart at 60 beats per minute to calm their nerves

Visualization

- Basketball free throw research
- Jim Santos "Positive Reinforcement"

Visualization

- Develop a Pre-jump routine
- Dwight Stones
- See the bar, see yourself going over it
- Feel the wind against your face
- Smell the grass
- Feel the pit against your back after a successful jump
- Focus ONLY on the aspects of the jump that you can control

PETTLEP Mental Imagery

The following seven items for sport psychologists to consider have been distinguished for convenience of communication. The model comprises: physical, environment, task, timing, learning, emotion, and perspective.

Physical

- Feel the spring in your step from the plant to elevating

Environment

- Outside conditions allow you to practice what you do in all jumping conditions
- Wear your running shoes outside so you can have the same feel, even though they are not your jumping shoes

Task

- Find your starting mark
- Jump up and down
- See your steps all the way to the bar, then over the bar
- Feel the run-up, the curve, the gather, the plant, hips up, and landing in the pit

Timing

Use a stopwatch to time the entire jump—pre-jump ritual, the run-up, the plant, in the air, the landing and getting out of the pit.

Learning

- Notice details that had not been evident before, so they can be remembered.
- Focus more and learn from each jump

Emotions

Enjoy the sensations of the emotional release at the completion of a successful jump.

Perspective

- Video the jump from various reference points around the high jump area, so the jumper can "see" the jump from more than 1 location.
- Pre-jump ritual can employ PETTLEP

WARNING!

- Jumpers have 1 minute to initiate a trial to completion. (National Federation High School high jump rules)
- Paralysis by Analysis

High Jump rules to know

- Time limit: 1 minute
- Time limit when 2-3 jumpers: 3 minutes
- Time limit when 1 jumper: 5 minutes
- Breaking the plane of the crossbar
- After 3 passed heights in a row, the jumper is allowed a practice jump (no bar)
- Standards are not allowed to be moved during the competition

High Jump rules to know

- If the pit (pad) hits the standard and dislodges the bar after the jumper makes a successful jump, it stands as a clear.
- The bar can only be lowered for a jump-off for 1st place.
- No viewing of visual aids by the jumper during competition

High Jump rules to know

- Jumpers continue until they have 3 consecutive misses.
- Jumper can miss at one height and pass to the next height—however they only have the remaining part of 3 jumps.
- Jumping out of the pit before the bar falls is not counted as a clear.
- Judge has final decision as to whether the jump counts as a clear, even if touched (wind)

To Jump Higher

- Use gymnastics board (Reuter Board)
- Do not jump off end of board—teaches long last step. Use short edge of board
- Start with medium height
- Use scissors jump to clear to get them used to board
- Switch to flop
- Go to higher heights than he/she has jumped
- Don't use very often—depend on bounce

High Jumpers in Action: World Records

http://www.youtube.com/watch?v=IclEQA48IOE
(long)
http://www.youtube.com/watch?v=eM24YXSpidU&feature=related
(short)
http://www.youtube.com/watch?v=2p86D2xjvvg
(Stefka)