

Extension Vertex

While on tip-toes, with the grounded pole tip centered in front of the vaulter and extension arm in peak position,

the "Extension Vertex" point is measured from the ground following a vertical line upward that intersects the center-line of the vaulting pole within the vaulter's "Grip Hand" position.

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Extension Vertex

A triangle is formed when the pole tip is connected via the "Ground-Line" to the base of the vertical line from the "Extension Vertex."

Ground Line

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When the pole tip is resting, centered on the ground, in front of the vaulter gripping the pole at a fixed "Grip Height" with a properly placed "Extension Arm," the length of the pole-side of the triangle remains constant...

and only the other two sides of the triangle can vary in their lengths.

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Whenever the lengths of these two sides vary, the point at which they intersect each other is always a 90 degree angle...

while the remaining angles (that are the inside angles at each end of the line of the triangle created by the pole) are variable.

90°

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Pythagorean Theorem, $a^2 + b^2 = c^2$, gives us the ability to calculate the distance between the bottom of the "Extension Vertex" line horizontally to the grounded tip of the pole.

b

c

a

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With side "b" our "Extension Vertex" height at 8 feet, and side "c" our pole intersect point at 14 feet, the length of the ground-line will be 11.4892 feet. Thus, "a" is rounded to 11' 6" in this example.

b = 8'

c = 14'

a = 11' 6"

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If the vaulter raises the "Extension Vertex" by jumping 24 inches off the ground, the length of side "b" will increase to 10 feet, causing a 1' 8" decrease to side "a" now reduced to a length of 9' 10".

b = 10'

c = 14'

a = 9' 10"

reduced 1' 8"

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The 8 inch drop to the bottom of the "Slideway" must also be factored in

8"

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WHY
AIR STRIKE
WORKS

This will put the vaulter another 8 inches higher relative to the pole tip's "Strike" point as side "b" now becomes 10.667 feet in length, which further reduces side "a" to 9' 1".

b = 10.667'

c = 14'

a = 9' 1"

reduced 2' 5"

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WHY
AIR STRIKE
WORKS

Regardless if the pole is fiberglass, metal, bamboo, carbon fiber, etcetera, greater angles between sides "a" and "c" at "Strike" produce superior outcomes.

b

c

a

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WHY
AIR STRIKE
WORKS

The easier it is for the vaulter to raise the vaulting pole past vertical towards the center of the landing surface area PROFOUNDLY increases the odds of succeeding at higher vaults with safer landings.

24 inch JUMP
to STRIKE

c

a

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