

essential movement principles

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If you have ever had the chance to watch elite climbers, you can see that their climbing looks graceful, effortless, almost like a surreal dance. How can they hold onto seemingly nothing at impossibly steep angles? How do they move from those unimaginable positions to other equally unimaginable positions further up the wall? Aside from having a very advanced level of fitness, they have mastered several essential skillsets that allow them to climb in the most effective ways possible. Fine-tuning these skillsets, or techniques, allows them to ascend through a series of moves with optimum efficiency. The utilization of energy in the most efficient manner is the driving principle behind elite climbing technique.

Beginning climbers tend to employ movement patterns that are instinctive or have been learned through previous experience. Think of a person climbing a ladder and then envision the same movements while climbing a rock face. The body is in a frontal position, facing the wall, and the hands and feet alternately reach and step upward. As detailed in the article on [body positioning](#), this stance is rarely the most effective, so movement based on this position is not the most efficient manner of ascension. How, then, do you apply the lessons of good body position to actual movement?

The same principles that govern good body position apply to efficient movement as well: straight arms and transferring the load to your legs. Thus, the most desirable transitional movement between good body positions is one that allows you to maintain straight arms for the longest amount of time. An added benefit of this approach is that using straight arms as your focus will force you to use your hips and legs in the most efficient manner. Not only does utilizing straight arms while turning your hips maximize the weight transference to your legs, this position also allows you a clear field of vision for effective footwork. If you are ever unsure of the most efficient way to make a move, find the technique that maintains straight arms.

Focusing on the arms can reap dividends in seemingly innocuous places, on moves that seem quite easy. For example, you are holding on to the wall with both hands and both or one foot is on the wall. It doesn't matter whether your hips are turned in or not, because you don't even need to move your feet or engage your legs to reach the next hold. When reaching for the next hold, don't bend your arms. Instead, turn your shoulders to cover the distance to the hold. This allows both of your arms to stay straight, causes your torso to twist which mechanically locks your core, and lets your body stay lower which increases the positivity of the holds and decreases the load on your arms.

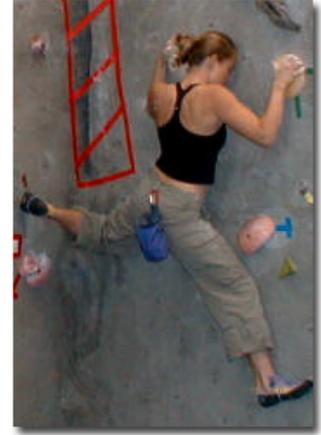
As for your hip orientation, just as in body position, making moves with your hips turned into the wall is an incredibly efficient way to ascend a rock face. Your legs supply the force necessary to move you upward and your body position ensures the least amount of energy will be exhausted to hold your body close to the wall. There will be some instances where it feels awkward to make a move with your hip turned in using a high step as opposed to just pulling up in the frog position, but any time you can eliminate bending your arms and activating your core you are saving energy. You may even have to make several foot placements in order to get your body position set to make the move efficiently. Remember that your legs can do this all day, so letting your legs do extra work is still often the most efficient technique. Eventually these techniques become second nature and your muscle memory will guide you through moves fluidly without you having to analyze the movement.

For instance, you are making a move to your right with your right hip turned into the wall. You are flagging with your left leg out and your left arm is straight while grabbing a hold. You are in a great body position and are set up to make the move efficiently. You push off with your right leg to initiate the movement up and to the right to grab the next hold. However, while making the move, you slightly bend your left arm to facilitate the move. When you are preparing to make the move, you are looking straight up towards the next hold and you follow that line of sight with your body's trajectory. If you focus on keeping your arm straight, your trajectory will be actually more of an arc to the hold than a straight diagonal line. Your arm acts as a tangible manifestation of the radius of the arc. This simple adjustment will keep your arm completely straight throughout the motion, thereby transferring the entire load of the movement to your legs and thus executing the move with the greatest level of efficiency. This type of movement that utilizes the hips turned into the wall with a straight arm is called backstepping. Linking several consecutive moves by alternating sides in this manner is often referred to as the cha-cha.

You focus on energy conservation everywhere you can because there will be moves that require the frog position and there will be moves that require you to powerfully yank yourself up the wall with your arms bent. Either you will need the extra energy at that spot to make those powerful moves or you will need it after those moves to finish the climb. However, you would be surprised how many instances that a slight modification will allow your arms to remain straight throughout the entire movement.

All of this technical attention is especially necessary when the movements are made statically. **Static climbing** ([VIDEO](#)) uses no momentum to transition between holds. Instead, it requires you to first position your body within reach of the new handhold and lock off with one hand or with your legs as you reach. The benefits of climbing statically are the increased ability to maintain tenuous foot placements, the delicacy of balance required to move through handholds lacking positivity, and the potentially superior perspective enabling visual investigation for the best handhold or grip position before committing to the move. This type of climbing exposes your depth of understanding of body positioning as it applies throughout movements.

Efficient movement techniques are critically important in static climbing, but they are no less important when using momentum in your transitions. **Dynamic climbing** uses momentum to carry you from one hold to the next; it may mean covering just a few inches or launching your body completely free from the rock in a 'full body dyno' to latch onto a handhold high beyond your reach. Moving dynamically can be an effective and efficient way to save strength and increase your reach. Swinging the hips in order to generate momentum to carry you up to the next hold transfers a greater portion of the load from your



arms to your legs, thereby saving energy. You may not be able to lock off and reach for the next hold with a free hand so using momentum to effectively increase your reach is the technical solution. Performing dynamic moves successfully requires a combination of coordination, timing, speed and accuracy. Grabbing a handhold at speed also takes contact strength and mental focus. Again, applying the focus on straight arms, transferring the load to the legs, and the low hanging body position allows you to make dynamic moves with the least energy necessary.

A simple way to improve your accuracy and efficiency when moving dynamically is to understand the concept of the '**deadpoint**'. Imagine a ball thrown in the air, as it travels upward it slows eventually stopping momentarily at the top of its arc before beginning to fall downwards. The brief instant of time where the ball is suspended motionless and weightless at the pinnacle of the arc is the deadpoint. The key to successful dynos, and even simple dynamic movement, is to coordinate your legs, arms, and hips to accurately propel your body to the target hold so that your hand(s) can grasp it when your body is precisely at the deadpoint. Deadpointing the hold gives you the best chance of successfully grabbing it because you do not have to adjust your muscle tension to absorb the downward pull of gravity that occurs right after the deadpoint.



It is necessary to cultivate proficiency in both of these types of movement when training. Dynamic and static climbing are quite opposite styles and yet both types of climbing are essential to being a well rounded, efficient climber. You need the deep level of body position understanding that comes from honing your static climbing agility, and you will need the ability to take advantage of dynamic movement for the technical and energy-saving benefits.

Successfully climbing a problem or route is often referred to as 'sending it' or 'crushing it,' and we refer to a series of moves and the corresponding footwork necessary to unlock the problem as the sequence. Your ability to visualize the movement sequence of a climb is an important skill to master. Knowing the sequence before you climb enables you to pick the most efficient body positions and moves without wasting energy while hanging on the wall. You want to be able to see the most efficient techniques for making the moves before you even get off the ground. Novice climbers tend to focus on handholds rather than footholds and climb one hold at a time. Instead of this approach, look for the moves that are 'forced', or can only be done one specific way. Next, determine the smoothest and most efficient ways into and out of these spots. This visualization skill will improve as your knowledge and comfort level with technique increases.

Learn a variety of climbing techniques and experiment with different movements to maximize efficiency and conserve energy. A specific technique or position might be necessary to solve a problem or move past a section of difficult climbing. Elite climbers have a vast repertoire of skillsets and are able to link movements quickly and efficiently allowing them to climb strenuous routes with few extraneous movements and no moments of indecision while on the wall.

So now you understand the principles of technique, body position, efficient movement, and visualization, but what about managing the physiological demands of climbing? The human body needs water to operate, so hydrate. Drink plenty of water during your session to contribute to maximum muscle performance. Your body also needs oxygen to operate, so don't forget to breathe and relax. Your muscles need fresh oxygen to function properly and holding onto excess tension resulting from anxiety wastes energy. That certainly is easy to understand on the ground, but what about if you are in the middle of a climb? How can you relax and recover when you still have to keep holding on?

If you are in the middle of a climb or are at a spot where you need to regain some energy, the technique of active resting should be employed. **Active resting (VIDEO)** is used to recover strength, lower the heart rate, and reinvigorate muscle performance. Good body positioning is essential to fully take advantage of the recovery possible with this technique. The hallmark of the good body position for active resting is the ability to shake the arm(s) out while they hang straight down without a load. This optimal resting position can take the form of a jug you only need one hand to hang on, a solid stem in a dihedral, or a knee-bar on overhanging terrain. Ideally, you can shake one arm out while maintaining a straight arm with the other, switching off to offer the rest to both arms. This technique can be used for an extended amount of time in order to regain the maximum amount of muscle performance needed for the rest of the sequence. A keen eye when visualizing a problem can pick out spots for active resting throughout the sequence. Hint: Before and after strenuous sections are excellent places to plan to actively rest.

Learn to fall. Falling is a natural part of climbing and you should endeavor to master the art of falling safely. Whether you are kicking off the wall and preparing to swing back into the wall like a cat when falling on lead, or you are flying off a highball boulder arranging your body to absorb the impact safely on the crash pads, this is an important skill to be familiar with. You never want to come off of the wall throwing caution to the wind and surrendering to the deliciousness of freefall. There are things you should be doing to orient your body as you fly through the air to ensure your greatest level of security upon impact. The more you safeguard yourself the less the opportunity for injury is available. Once you become comfortable falling, you will relax and climb more freely and efficiently.

Be critical and detailed in your self-evaluation of your climbing. This will allow you overcome difficult sections of a climb quicker. When you get to a problem spot on a climb, you will have the knowledge necessary to solve the riddle. Is it a single move where a different body position or movement style will be the most effective? Is it a powerful move you don't have the energy for? In which case, you wire (ruthlessly technically perfect the moves) the beginning of the climb to conserve as much energy as possible for when you really need it. Or, you actively rest in more spots to regain strength as you go.

A positive mental attitude is invaluable in surmounting the obstacles encountered when climbing. All of this focus and detail are the nitty-gritty physics of climbing, but the intangible aspect is your drive and hunger for success. Find your 'zone' and allow your carefully cultivated and innate abilities to fully flourish. Each time you start out on a climb or problem, have it in your mind that you are going to send it right now. Your font of energy and desire are going to put you over the top no matter what. You will be pleasantly surprised how much of a difference simply believing against your assessment of your abilities can enable you to excel. And most importantly, don't forget to have fun!

Technique Examples

Bumping

Quickly moving your hand a small distance from one hold to another. This type of movement can take advantage of intermediary holds within a sequence by breaking up a longer move between good holds with a quick pause or additional pull off of a less positive hold. Bumping is also useful for getting back on sequence if you find yourself off sequence.

Campus

The act of climbing without using any feet. Literally yanking yourself up the wall without using your feet on footholds. Campus expends incredible amounts of energy and is therefore the least efficient way to ascend, though there are rare instances where this is the only practical method for ascension.

Frogging

This type of movement is characterized by hips opened to the wall, the insides of both knees turned towards the wall, and both feet pointing outwards. Instead of turning your hips to keep your weight into the wall, body tension is maintained through engaging your core muscles. Frogging is a very powerful technique that uses a lot of energy, especially as the wall angle steepens.

Gaston

The gaston (pronounced *gas-tone*) is named for the influential French climber Gaston Rébuffat. A gaston is used on a sidepull located above the shoulder whose positive edge is facing towards the climber instead of away. To use a gaston, grab the hold with your fingers and palm facing into the rock and your thumb pointing downward. Like other sidepulls, a gaston requires oppositional force with your feet for maximum effectiveness.

Mantel

A move used to surmount a ledge or feature in the rock without pulling down on holds, instead taking advantage of oppositional forces. Utilizing a friction grip, it involves pushing down on a ledge or against a feature on the wall.

Matching

Matching is when you match your hands on a large handhold, often a wide edge or a jug, by placing them next to each other or switching the dominant hand that is holding on. Matching allows you to change hands on a particular hold so that you can reach up to the next one more easily. It can also be used to get back on sequence if you are off. It's easy to match hands and fingers on big holds since they will be side by side. It's more difficult to match on small edges. If it looks like you have to match on a small hold, keep your first hand to the side of the hold with maybe only a couple fingers on it. In some instances on hard routes, you may have to match by lifting one finger at a time off the hold and then replacing them with your other fingers, called 'piano matching.'

Stemming

The technique of stemming comes into play when you are ascending the inside of a dihedral or there is an opposing face to take advantage of with your hands and feet. Generally, stemming allows you to take a wide stance with your hands and/or feet minimizing the amount of force necessary to stay on the wall. This can often be used to gain a 'no hands' rest. Stemming requires balance, technique, and flexibility.

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