

Who Needs a Gym?



Cameron McGarr, C.S.C.S.,
Photographs By Mark Hanauer
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Few men believe it, but you don't need barbells, dumbbells, or machines to build muscle; in fact, weight-training equipment often inhibits the process. That's because it requires you to be in a specific location, which might explain why more men consider themselves runners than lifters. After all, running is the most accessible form of exercise anywhere you go, there's your gym. But learn a little bit about physics and the same can hold true for your muscle workout.

Consider the pull-up: It's the standard by which all body-weight exercises are measured. And even the most hard-core lifters will agree that there's no better muscle builder for the upper body with or without weights. The reason for its effectiveness: It takes full advantage of the scientific laws of motion and leverage, placing your body in a position that forces your back and arms to lift your entire body weight. Call it applied science at its finest.

Now imagine if all body-weight exercises were as challenging as the pull-up. You'd be able to build muscle anywhere, anytime at home, on the road, or even in a public park. Physical science makes it possible. So with that said... the Five Laws of Body-Weight Training:

Law #1: The longer your body, the weaker you become.

The Science: By increasing the distance between the point of force (your target muscles) and the end of the object you're trying to lift (your body), you decrease your mechanical advantage. Think of it this way: An empty barbell is easy to lift off the floor if you grab it in the middle. But try moving a few inches in one direction and it instantly seems heavier even though its weight hasn't changed. The same is true of your body: Lengthen it and every exercise you do becomes harder.

Apply it: Raise your hands above your head so your arms are straight and in line with your body during a lunge, squat, crunch, or situp. If that's too hard, split the distance by placing your hands behind your head.

Law #2: The farther you move, the more muscle you work.

The Science: In physics, "mechanical work" is equal to force (or weight) times distance. And since your muscles and bones function together as simple machines they form class 1, 2, and 3 levers the same formula applies to your body. It's the most basic of principles: Do more work, build more muscle. Of course, in a weight-free workout, you can't increase force (unless you

gain weight). But you can boost your work output by moving a greater distance during each repetition.

Apply it: Each of the following three methods increases the distance your body has to travel from start to finish, increasing not only the total amount of work you do, but also the amount of work you do in the most challenging portion of the exercise.

Hard: Move the floor farther away. For many body-weight exercises lunges, pushups, situps your range of motion ends at the floor. The solution: Try placing your front or back foot on a step when doing lunges; position your hands on books or your feet on a chair when doing pushups; and place a rolled-up towel under the arch in your lower back when doing situps.

Harder: Add on a quarter. From the starting position of a pushup, squat, or lunge, lower yourself into the down position. But instead of pushing your body all the way up, raise it only a quarter of the way. Then lower yourself again before pushing your body all the way up. That counts as one repetition.

Hardest: Try mini-repetitions. Instead of pushing your body all the way up from the down position, do five smaller reps in which you raise and lower your body about an inch each time. After the fifth mini-repetition, push yourself up till your arms are straight. That counts as one repetition.

Law #3: As elastic energy decreases, muscle involvement increases.

The Science: When you lower your body during any exercise, you build up "elastic energy" in your muscles. Just like in a coiled spring, that elasticity allows you to "bounce" back to the starting position, reducing the work your muscles have to do. Eliminate the bounce and you'll force your body to recruit more muscle fibers to get you moving again. How? Pause for 4 seconds in the down position of an exercise. That's the amount of time it takes to discharge all the elastic energy of a muscle.

Apply it: Use the 4-second pause in any exercise. And give yourself an extra challenge by adding an explosive component, forcefully pushing your body off the floor into the air as high as you can during a pushup, lunge, or squat. Because you're generating maximum force without any help from elastic energy, you'll activate the greatest number of muscle fibers possible.

Law #4: Moving in two directions is better than moving in one.

The Science: Human movement occurs on three different geometric planes:
the sagittal plane, for front-to-back and up-and-down movements,
the frontal plane, for side-to-side movements,
the transverse plane, for rotational movements.

Most weight-lifting movements the bench press, squat, curl, lunge, and chinup, to name a few are performed on the sagittal plane; the balance of exercises for instance, the lateral lunge and side bend occur almost entirely on the frontal plane. This means that most men rarely train their

bodies on the transverse plane, despite using rotation constantly in everyday life, as well as in every sport. Case in point: walking. It's subtle, but your hips rotate with every step; in fact, watch a sprinter from behind and you'll see that his hips rotate almost 90 degrees. By adding a rotational component to any exercise, you'll automatically work more muscle since you'll fully engage your core, as well as the original target muscles and simultaneously build a better-performing body.

Apply it: Simply twist your torso to the right or left in exercises such as the lunge, situp, and pushup. You can also rotate your hips during movements such as the reverse crunch.

Law #5: The less contact your body has with the floor, the more your muscles must compensate.

The Science: The smaller the percentage of an object's surface area that's touching a solid base, the less stable that object is. That's why SUVs are prone to rolling, and tall transmission towers need guy wires. Fortunately, humans have a built-in stabilization system: muscles. And by forcing that internal support system to kick in by making your body less stable you'll make any exercise harder, while activating dozens more muscles.

Apply it: Hold one foot in the air during virtually any exercise, including pushups, squats, and deadlifts. You can also do pushups on your fingertips or your fists.