

Center of Gravity

Ever notice that certain body types seem to excel at certain sports? You might think that the perfect athletic body always looks like this.

Ooh!

Well, depending on the sport, world-class athletes can come in a variety of shapes and sizes. So what's the advantage? Let's start by comparing two very different athletes-- gymnasts, who tend to be short, and high jumpers, who tend to be tall.

The key to both of these sports is the location of the athlete's center of gravity. Now, everyone has one. It's that point on your body where your weight is equally balanced on either side. In most people, it's located right about here, around your belly button.

The shorter you are, the closer your center of gravity is to the ground. And in gymnastics, that's an advantage. What a low center of gravity does is give you better balance. And obviously, in gymnastics, balance is crucial. But why does it give you a better balance? Whoa!

Well, the concept can be explained using these two blocks. Now, you can see that they're both the same width, only one is tall and one is short. And these dots here in the front indicate the location of each block's center of gravity.

Now, to tip over either block, I have to push them until their center of gravity moves outside of their base. But here's the interesting part. To tip over the tall block, I have to push it this far in order for it to fall over. With the shorter block, I have to push it over a lot further before its center of gravity exceeds its base and it finally falls over. So for a gymnast, being short means you're less likely to lose your balance during a difficult move than a taller person.

Now let's look at the high jumper. Compared to the gymnast, they're the complete opposite. For them, it's an advantage to have a high center of gravity.

That was a great job-- a lot of height.

That's because the key to a successful high jump is being able to raise your center of gravity over the bar. If you can't get your center of gravity at least this high, then there's no way you can make the jump. So the higher your center of gravity is to start, the easier it will be to get your body up and over the bar.

And that's why the best high jumpers are tall and have very long legs, because it gives them a high center of gravity.

And she's happy.

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This is Chris's third and final attempt. Here he goes. He's making his approach. He's up, and he's-- he's-- he's over! It's a new world record, ladies and gentlemen. The crowd is going wild! In his dreams.
