In this tutorial, you're going to learn about the normal distribution. The normal distribution is one of the most important ideas in all of statistics. It's going to be a really good idea to learn this one really well.

So you may have heard of the term bell curve before. Does that refer to shape, center, or spread? A bell curve refers to shape. So what do we mean when we say that something is bell curved in terms of its shape? We would say it's unimodal, single-peaked. And it's also symmetric.

And so visually, it looks like this. And this is what the normal distribution is. It's also sometimes called the Gaussian distribution, named after the mathematician, Carl Friedrich Gauss. But this normal distribution-- "normal" doesn't mean that it's usual or always happens or typical. "Normal" just means that it's going to be single-peaked and symmetric.

And since the shape of these distributions is always the same, the only thing that's going to be different about different normal distributions is going to be their center-- that is, where they're placed on the x-axis-- and their spread-- how wide they are.

It would be reasonable to talk about something that had a spread of 5 versus something that had a spread of 20. Those would look a little different. Their shapes wouldn't be any different. But they would look a little bit different. One would be a little bit wider. And one would be closer together.

And so we're going to use a measure of center and a measure of spread. Pause the video real quick and see if you can think about which measure of center we're going to use and which measure of spread makes more sense to use.

What you should have come up with is we're going to use the one that's most versatile. The mean is the more versatile measure of center. And because the mean is going to be our measure of center, we're going to use the standard deviation as our measure of spread.

Now, you might be thinking to yourself, but since it's symmetric, the mean and the median are the same. And you're right. And in fact, the mode is the same as the mean and the median in this distribution. So it doesn't really matter if we talk about it being the mean or the median. But typically, we're going to say that it has a specific mean and a specific standard deviation.

And so this is really all we need, is we need the shape, this bell curve shape. And we need to know what the mean is-- remember this Greek letter, mu-- and the standard deviation, what that is. This is the Greek letter, sigma.

And once we know that, we know all we need to know about the normal distribution. And because we only need to know about the mean and standard deviation, sometimes you'll see something shorthanded this way-- N, (mu, sigma).

N means the normal distribution, with mean, mu, and standard deviation, sigma. Because mu and sigma are all we need to know, the mean and standard deviation, those are all we need to know in order to know what this thing looks like-- sometimes you'll see it shorthanded this way. And this is a nice, compact way of writing the normal distribution.

And so to recap, all normal distributions look the same. The normal distribution's a very, very commonly-used family of distributions. I say family of distributions because they're not all centered at the same place, and they're not all spread out the same way. But they all look the same. They're all single-peaked and symmetric.

And therefore, all we need to do is to find them by their mean and their standard deviation. These three terms that we used in this tutorial-- normal distribution, Gaussian distribution, and bell curve-- are all synonyms. You can use all of those. I will be using the term normal distribution almost exclusively, though. Good luck. And we'll see you next time.