In this lesson, we're going to talk about the difference between 64-bit and 32-bit versions of the Windows operating system. Now, as of Windows 11, there is only one main version of Windows, and this is the 64-bit version. But if you go back into Windows 10 and some of the earlier versions of Windows, you could buy Windows as either a 32-bit version or a 64-bit version. Let's talk a little bit about the differences between these two versions. When you're dealing with a 32-bit version of the operating system, this means you can run only 32-bit programs. But if you're running the 64-bit version of the operating system, you can run either 64-bit or 32-bit programs because it is fully backwards compatible. So it seems to make sense that we'd want to use a 64-bit version of the operating system because it opens up all of the different programs to us, both 32-bit and 64-bit, for use inside of Windows. But that's not always the case. And this is because each piece of hardware is going to be designated as either 32-bit or 64-bit based on the processor type being used. If you're using an x86 or 32-bit processor, you're going to have to use a 32-bit operating system like Windows 10 x86, which is the 32-bit version of the operating system. On the other hand, if you have a newer processor that supports 64-bit operations, which we call an x64 processor, then it can support 64-bit operations. In these cases, you can operate 64-bit versions of the operating system as well as the software on top of that operating system and the older 32-bit software programs that you can run inside of the 64-bit operating system because it does have backwards compatibility. Now, when it comes to choosing an operating system version, you normally want to choose the version of the operating system that will align with your processor type. So if you're using a 64-bit processor, you should be using a 64-bit version of Windows. And if you have a 32-bit processor, you should be using a 32-bit version of Windows. But you'll find this is not always going to be the case. And the reason for this is that, when you're using the 32-bit version of Windows, it actually has lower memory requirements. In Windows 10, if you're going to be using a 32-bit version of the operating system, you only need one gigabyte of RAM to be able to run that operating system. But if you're using the 64-bit version of Windows, you have to have at least two gigabytes of RAM to be able to run that operating system. That being said, in either of these systems, you really do want to have a minimum of about four gigabytes to run Windows efficiently. Otherwise, you're going to have a lot of virtual memory usage, and this can then create a lot of reading and writing to your hard disk or storage device to be able to create that virtual memory for you by using a page file on that storage device. Now, depending on which version of the operating system you choose, whether that's 32-bit or 64-bit, you're also going to have some limitations in terms of how much memory you can access. When you're using a 32-bit operating system, it only has 2 to the 32nd bits to be able to use as addressable space and memory. This means you can only address a maximum of four gigabytes of memory if you're using a 32-bit version of the Windows operating system. So if you have a laptop that has eight gigabytes, 16 gigabytes, or 32 gigabytes of RAM, you're going to need to use a 64-bit version of the operating system in order to access all of that memory at one time. Otherwise, if you install the 32-bit version of the Windows operating system onto a 64-bit system that has eight gigabytes of memory installed, you're only going to see four gigabytes of memory within the Windows operating system because that's all it can address using a 32-bit addressable space. So, remember, when it comes time to pick your operating system, you need to check whether or not your processor can support 32-bit or 64-bit operations. If it supports 32-bit operations only, you're going to have to use a 32-bit version of Windows. This means you're going to have lower memory requirements, only requiring one gigabyte of RAM to be able to install this Windows operating system. But it is going to limit you to using Windows 10 because Windows 11 only operates in 64-bit modes. When it comes to a 64-bit processor, you now have the option of using either Windows 10 or Windows 11, using a 64-bit version of that operating system. This means you can access much more memory because you can go above that four-gigabyte limit. In fact, if you're using Windows 11 Home Edition, you can access 128 gigabytes of RAM. And if you're using Windows Pro Edition, you can access two terabytes of memory when using the 64-bit version of the Windows operating system.