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说话人1 00:00  
Imagine you have an extremely, musically talented friend and he challenges you to this game. You are given a musical chord, which is basically a combination of a few nodes, and it sounds like this. Your task is to figure out what the individual notes are like this. In this specific case. There's just one slight issue. However, nothing about music. But luckily, for you, there's one tool that can save you from losing this game. The fourier transform, essentially, sound is passed through vibrating air molecules. The first set of air molecules pass on their vibration to the next compressing and expanding the space in between in a rhythmic pattern as it reaches your ear. For instance, if we take one node and graph this change in compression over time, you can see a really nice oscillating pattern.

Now, the frequency is what we need to focus the most on, because that differentiates our notes from other notes. It is a measure of how fast waves are oscillating and determines the unique pitch for sound waves. If we increase the frequency, making air molecules around as vibrate even faster, then the pitch will also go higher. For one note, there's just one frequency, and we can identify it easily on the graph. But our friend challenged us to many notes combine. And if we take the sum of, say, five notes, the resulting air pressure graph will look much more complicated. And that's where the fourier transform comes in. The basic idea is that pretty much all functions can be dissected into simple sinusoidal waves, whether it's our pressure curve or a seemingly random curve, like me speaking. By applying this strangely, looking mathematical formula, we can get back a frequency distribution of the simple sine curves that compose the original curve. The fourier transform is perhaps one of the most commonly used mathematical tool in monitoring technology. Dissecting functions into frequencies also allows us to understand and store images and video.