Our Mathematical Senses

The Geometry Vision

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Lecture - 05

Video 1D: why do some lines remain parallel?

Finally, let's answer the last question that we raised, which is why do some lines remain parallel in their image? In particular, I'm talking about these horizontal side rails. They were parallel in real life and their images are parallel in the picture plane. So why is that? Let's return to our top-down view and let's take a closer look at the railway ties. So again, the railway ties, I mean these guys here that are running between the tracks, and we need to follow the image of a railway tie further and further out on our picture plane in order to understand, first of all, why it doesn't terminate and secondly, why they remain parallel. So let's extend our picture plane and let's extend one of the railway ties. Once we've done that, let's ask the question, where is the vanishing point of this extended railway tie? To find it, let's look further and further and further and further along it.

We can quickly end up going out of our screen here, but that's okay. You can kind of imagine looking further and further along it. And what happens? Well, once again, you're going to reach a limiting sight line as you look further and further along it. And that sight line is once again going to be parallel to the line you're observing.

But what's happening a bit that's kind of new in this situation? Well, the sight line which is parallel to the railway tie, it's never going to touch the picture plane, it's never going to meet, it's never going to create a vanishing point, because it's parallel to the picture plane. And the reason it's parallel to the picture plane is because the railway tie is parallel to the picture plane, and our sight line is parallel to the railway tie. So our sight line will therefore be parallel to the picture plane. So, in this situation, no vanishing point, and the line continues to appear infinitely long in the picture plane.