Here we have a little block that sits on that surface.

And well, what can one do with a block?

You can push it, or you can pull it.

And that's exactly what we're going to look at now.

So I can exert a pushing force onto this block here, F push.

But I could also pull it like this, F pull.

And the question is, how can we formalize this a little bit more?

We can now also look at a small piece of rope or a string.

And I could, in the tug of war, I'm going to pull here.

And I'm also going to pull here.

And we'll see who is going to win.

So we have two opposing forces here on either side.

In a slightly different scenario, where we're going to put both of these things together, we have a block here sitting on a surface.

And we have a little string attached to it.

And let's say we have a pulley here, and the string goes around there and has a little mass hanging here.

We want to now describe what this force is here that's pulling things.

And for that, we have to look at what's going on in that little string.

So let's draw another string.

And this is our string.

And let's take an imaginary cut right through the middle here.

And I'm going to draw both pieces here.

This is the left part, and here is the right part.

And what's happening in this rope here now?

Well, there is a force acting on the left object due to the interaction with the right one.

And here we have a force on the right one, due to the interaction of the left piece.

And that, of course, happens anywhere.

I take a cut here along the line.

And we can even formalize that a little bit more by just placing our coordinate system here.

And let's say x equals 0 here.

And so for all x along this line, we always have these pairs of forces.

So they are an interaction pair.

And if I look at the rope from afar, they will cancel out.

But if I look at what's going on inside the rope, then this is what they are.

And we know from Newton's third law that F RL equals minus F LR.

So they're forces of the same magnitude, but the opposite direction.

If they weren't the same, then my rope would get in trouble.

But what we want to define now actually is tension, the tension force, that is along, that's happening along, this rope here in our tug of war if someone pulls from the outside.

And for that, we first got to look at the magnitude of our interaction pair here, F RL.

And that, of course, equals the magnitude of F LR.

And we're actually going to define now this magnitude here as the tension force.

And that is true for all x along this line here, that we have this, the magnitude, that this is the magnitude of this force here.

And from now on, we're going to call-- when we talk about tension in the rope, then we talk about the magnitude of one of these internal forces here.