Now that we've chosen a coordinate system for our runner going along the road, we now want to describe the position function of our coordinate system with respect to our choice of origin.

Now, the runner is a non-rigid object.

Legs and arms are moving back and forth.

So let's just imagine that there is some fixed point in the runner at the center, and let's give a vector.

So we're going to draw a vector from above our origin to that point, and this is what we'll refer to as our position function.

Now, remember, every point here has an x-coordinate, so we can now introduce our position function, which we'll call x of t, which is the coordinate location with respect to the origin.

This is a function that will change in time.

And our position vector is r(t) equals the position function x(t).

Now, remember, this is a vector.

The position function is just a quantity that's describing the location of this point with respect to the origin, but the unit vector is how we describe this as a vector, and so we write i hat.

Now, x(t) is what we call the component of the position vector.

Remember, a vector has a component and a direction, and the component is the position function.

And that component x(t) can be positive, as you see in this particular case.

x(t) can also be zero.

That's if you're located at the origin.

And if our runner is on the other side of the origin, x(t) can be negative.

So the component of the position vector can be positive, zero, or negative, and the direction of the position vector is the sine of the component times i hat.

If the component is negative, then we have a negative i hat.

The position vector is pointing backwards in the minus x direction.

And if x(t) is positive, positive i hat position vector as shown in this particular case is in the positive i hat direction.

So that's our first vector, the position vector, in one-dimensional motion.