Physics A: Velocity

Scene #	Description	Narration
1	A purple slide showing the Title: Velocity: We are very familiar with this!	Today, we're going to learn about velocity, which is something that we're actually very familiar with. It's actually just a fancy word for speed.
2	Slide 2 is titled “Motion Vocabulary” The definition for velocity is shown as the narrator talks about it. He writes the formula for velocity on the screen. The definition for average velocity is also displayed. Finally, the definition for instantaneous velocity is displayed and discussed.	So velocity-- velocity is how fast an object moves in a certain direction. So it's our second vector that we're going to be learning. And we certainly have to take into account the direction. So velocity is actually displacement over time. So if we actually look at the formula for velocity here, we're going to have our V for velocity with a vector arrow above it. And then we're going to have that equal to displacement, which is the change in position of an object, divided by change in time. Remember, that delta is for the change in. And then it's units are meters per second. And this should makes sense because if we take the units of displacement, the units of displacement are meters, and if we take the unit for time, the time is seconds. So we get meters per second. One very common thing here is average velocity, which is the total displacement of an object divided by the time interval during which the displacement occurred. So you'll often here in textbooks or hear professors say average velocity when talking about normal velocity. And then we also have to be concerned with instantaneous velocity. And this is the velocity of an object at a specific position or time. I like to think of instantaneous velocity as taking one reading. So for example, if you're on the highway and you pass a cop, who is taking speeds down, he will actually get just your instantaneous velocity. So whereas you may have a 55 mile per hour velocity for the duration of an entire trip, your instantaneous velocity may be at one moment during that trip.

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3	Slide 3 is Motion Vocabulary Continued. The definition for speed is shown as the narrator discusses it. The narrator writes the formula for speed underneath the definition.	So speed is how fast an object moves. This is the scalar form of velocity. So it's very similar to distance when compared to displacement. And it is the distance divided by time. And we're going to take a normal V, which represents speed, and we're just going to simply take a normal d and divide it by the change in time. Or we can even think of this as distance divided by a change in time. And its units are still meters per second, because distance is meters and time is still seconds.
4	Slide 4 is titled: “Velocity is the Slope of Position vs. Time Graph”. A graph is shown with a straight line. The narrator describes the meaning. A second graph is showing with a positive line going diagonally up. The narrator describes the meaning. Finally a third graph shows a diagonal line with a negative slope and the narrator describes the meaning.	So one thing that we have to be concerned with when discussing velocity is that velocity is the slope of a position versus time graph. So let's say that we have an object that over the course of time is not changing position. Let's just assume that that's maybe 5 meters. So it stays at the 5 meter mark for the duration. This will tell us because it's a flat line that velocity or the change in position or the change in displacement is actually 0 meters per second. Notice that it's not changing up or down. So it's really not displacing. We could also have a graph that looks like this, where the position is changing over time in the positive direction. So we'd get velocity is some type of positive number. If you notice here, we are increasing our position as time continues. And then, of course, you could have position versus time graphs that have a negative slope, which tells us that velocity is negative. Forgot my signs here-- I mean my vector arrows here, so sorry. So it's negative, as we see our position is getting smaller or displacement is getting more and more negative as time continues.