Physics A: Solving Physics Problems

Scene #	Description	Narration
1	In slide 1 the narrator summarizes the rules for solving problems in physics. Each rule is shown on the slide as he discusses them.	Today's lesson is about solving physics problems. In this presentation, we're going to go over some helpful hints about how to attack some more difficult physics problems. So rules for solving problems in physics, there's three of them. And the first is that you need to use a pencil with an eraser. Oftentimes, you will make mistakes, and that's OK. But in order to keep our paper a little bit neater, we're going to want to use a pencil with an eraser. Rule number two is to show all of your work. Like I said, you're not going to get every answer perfect the first time through. And you're going to want to go back and easily find where your mistake was. And if you show your work, that will certainly help. Then rule number three is to circle your final answer. You want to make sure that your final answer stands out on the page and doesn't get confused with some of the other written work on the paper.
2	In Slide 2 the narrator summarizes the steps to problem solving. An image of a pirate standing on a treasure chest with a parrot on his arm is on the right side of the slide. The six steps spell the acronym PIRATE.	So problem solving steps, there are six of them in physics. And the first is to draw a picture of the problem. Sometimes it's easier to visualize the scenario. And that will help us get some idea and some clues as to how to go about solving the problem further. Second step is to identify the given information provided in the problem. Step three is to write the equation in the letters first. Step four is to do the algebra, show all of your work as previously mentioned. Step five is to think about your answer. Does this answer make sense? In physics, the problems are often written so that they're realistic. And you can often decide whether your answer is legitimate by just simply, does this make sense.

		And then the last step is to explain your final answer. So if you actually look at all of our six steps here, you'll notice that we get the acronym PIRATE. So when solving problems in physics, think about the physics pirate.
3	In Slide 3 an example problem is showing. The narrator reads the problem out loud. A picture is shown of 2 cars one at rest and one at acceleration. A red letter P is at the top of the picture. The rates are labeled by the cars.	So let's do an example here. A car starts from rest and accelerates at 4.3 meters per second squared to a speed of 22.0 meters per second. How far did it travel? Well, our first step is to draw a picture of the scenario. What you'll notice here is that I have a before and after picture. I have also labeled some of the information provided in the scenario.
	A red letter I is shown by the beginning of the problem. The initial velocity, acceleration, final velocity and distance are written below the I.	Second step is to neatly organize the information that is given to you in the problem. So we notice that we have v i, which is the initial velocity, is 0, because it started from rest. And then you have the acceleration, which is 4.30 meters per second squared. Then you have the final velocity, also known as the v f as equal to 22.0 meters per second. And then lastly, I like to write down the variable that you're solving for with a question mark to make sure that you include it in the equation. In this case, it's distance or how far did the car travel.
	A red letter R is in the center of the slide and the equation being used to solve the problem is shown.	The next step is to write down your equation. Now, I don't expect you to know or be familiar with this equation. But down the road in this course, we will use this equation. And that equation is v f squared equal to v i squared plus 2ad.
	The red letter A is shown below the equation as the narrator writes down the algebra and the steps to solve are recorded.	Then we want to start doing our algebra. And because we've set up a neat data table, we really just have to take that given information and plug it into the equation accordingly. So we get 22.0 meters per second squared equal to 0 plus 2 times the quantity 4.30 meters per second squared times d. Continuing our algebra, we get 484 meters squared over seconds squared equal to the quantity of 8.60 meters per second squared times d.

	The red letter T is over the answer.	Now, you'll notice that I actually did all of the algebra with the units in addition to the numbers, because we want to make sure that our units cancel out later on in the problem. So we solve for d here by dividing both sides by 8.60 meters per second squared. And then we get a final answer of d equal to 56.3 meters. Now, I'm going to think about this problem and ask myself does it make sense, and it certainly does.
	The red letter E is over the explanation of the answer.	The last step here is to explain your answer. And that is simply writing a short sentence, the car traveled 56.3 meters.