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Exploring Kinematics with The Moving Man simulation

Bruce Peachey
The College at Brockport

Generic Lesson Plan Template

You should submit this form in addition to any computer generated files/documents/models to your group folder on Angel. Please create a .zip file and upload the group of files as a single archive.

Name: **Bruce Peachey**
Grade level(s)/Subject taught: **12/Physics**
Objectives: To learn the basics of position, velocity, and acceleration, and how they interact. To see how these quantities interact graphically; to graph them; and to interpret graphs of them.

Please provide a rich **one-page, single-spaced**, description or a *vision* of your best thinking on a way or ways you might teach the planned lesson. (approximately ½ page for the teacher role, ½ page for the student role). Also, construct a tentative rubric that you might use with your students (see example)

Items to include in your lesson plan: (Choose your discipline/concepts from your own area).

1. *Write* the Mathematical Concept or "key idea" that modeling will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships)

and/or…

1b. *Write* the Science Concept or "key idea" that modeling will be used to teach: (e.g. Organisms maintain a dynamic equilibrium that sustains life).

Velocity is the rate of change of displacement with time; acceleration is the rate of change of velocity with time. Displacement, velocity, and acceleration can be plotted vs. time, and the graphs are related.

Materials:

"…a rich **one-page, single-spaced**, description or a *vision* of your best thinking…"

Prompts:

1. How will you assess the prior knowledge of the student?
2. How will you begin the lesson?
3. What are the teacher and students doing every 5-10 minutes? (Teacher Actions and Student Actions
4. How will you assess the learning for the lesson?

Using ___The Moving Man simulation and related documentation___ I plan on having my students…
(software / modeling package(s)

1. I will use Worksheet "Kinematics 1" to help them see what they already know, and to make adjustments as needed so that they have the mathematical relationships down. This worksheet will be passed out before any teaching takes place at all.

2. The lesson will begin with a discussion of the fact that they have been doing a physics lab their whole lives, and it's time now to start to make some sense out of the data. We'll discuss some examples of this, including some offered up by the students. Once that settles down, we'll pass out the worksheet and let them try their hand at the math. They'll soon see that they've been making this type of judgments since they were young, but may not have thought of them as equations.

3. Introducing the idea of physics, talking about motion, defining terms.
Discussing past experience and how it relates to what we will be learning.
Working on Kinematics 1 worksheet together and coming up with answers.
Most likely an involved discussion on the length of an American football field in yards. This leads to a discussion of picking an answer you know you can defend when faced with what appears to be an ambiguous situation.
Going over answers, reasoning, and method for the Kinematics 1 worksheet.
Trying the prelab questions for The Moving Man simulation.
Working on The Moving Man simulation, and following the student instructions.
Discussing problems and issues as they come up. Testing answers on each other, and discussing which are best.
Checking information and answers as we go along.
Ultimately, making sure that each student got the correct idea about the motion relationships, and how the three variables relate graphically.

4. Assessment will be accomplished through the post-lab questions (same as the pre-lab) first. Students should find they are much more confident about the answers now, and that several of their responses have changed.
A follow-up worksheet will also be used. Ultimately, the students will receive a pre-quiz with answers, and then a quiz on this material.