Fayne Winter July 25, 2006

Lesson Plan 3 – 2nd one

Exploring D=RT With Interactive Physics

Name: Fayne Winter
Grade level(s)/Subject taught: 7th Grade Math
Objectives: Students will explore and use the equation: D=RT, filling in the appropriate measures for Distance, Rate, and Time, from the different representations in Interactive Physics. Students will be able to look at an IP model and figure out in what form the D=RT equation is given, for example is it in its common form or is it in the form of R=D/T, etc. Students will learn how to transform equations for a specific value in that equation.

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)

Patterns and Functions – Describe functions being represented by a model. Describe functions and generalize by theuse of rules and algebraic expressions.

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).

Materials: Pencils, calculators, Interactive Physics

- **Using ___Interactive Physics____ I plan on having my students…**
  (software / modeling package(s)

Warm-Up: Students will solve different equations in the form of y = kx.

Mini-Lesson:

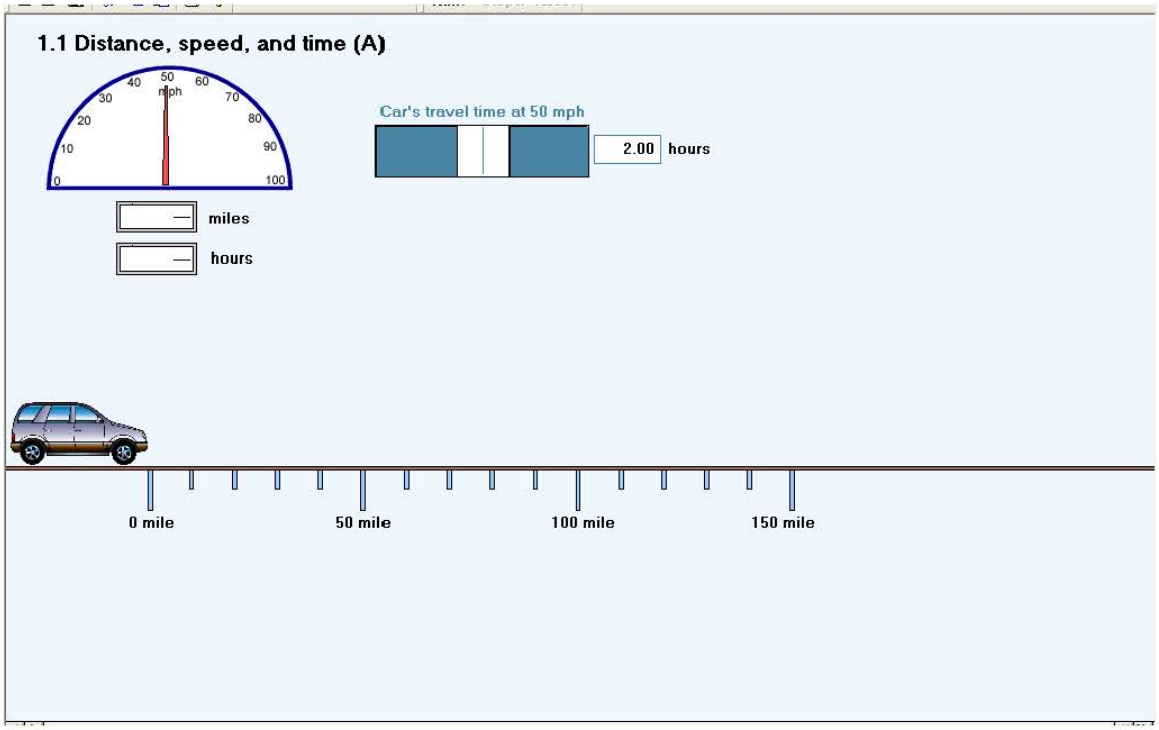
What equation do we use to solve distance/rate/time equations?
How can you calculate the distance you will drive in 2 hours if you drove at a steady rate of 20 mph?
What if you knew the distance and the time, but not the rate? How would you set up that equation and then solve it?
How do you transform an equation such as D=RT to R=D/T?

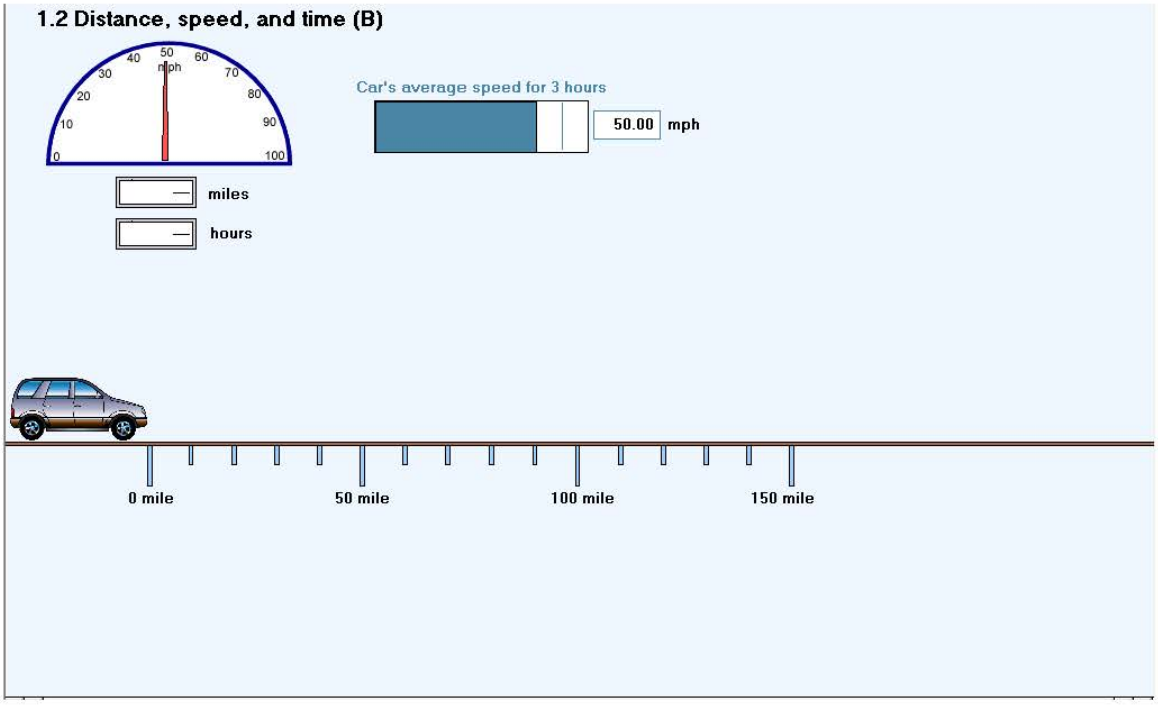
Work Time: Students will explore the IP file "Speed Distance and Time". In this file there are 6 different models and students will work with the first 5. With these models, depictions of the relationship between time, distance, and speed are shown in different forms. Some show the relation between speed and time to give distance, others use the relation time and distance to give speed. Students will be exploring these activities and writing the equation that is being modeled in each screen. For example, if speed and distance are given, time would be the value on the 'left' side of the equation. If distance and time are given, rate would be the value on the 'left' side of the equation. Students will need to identify the form of the equation each IP simulation is in and write the equation in that form. They will need to transform the equation in many cases.

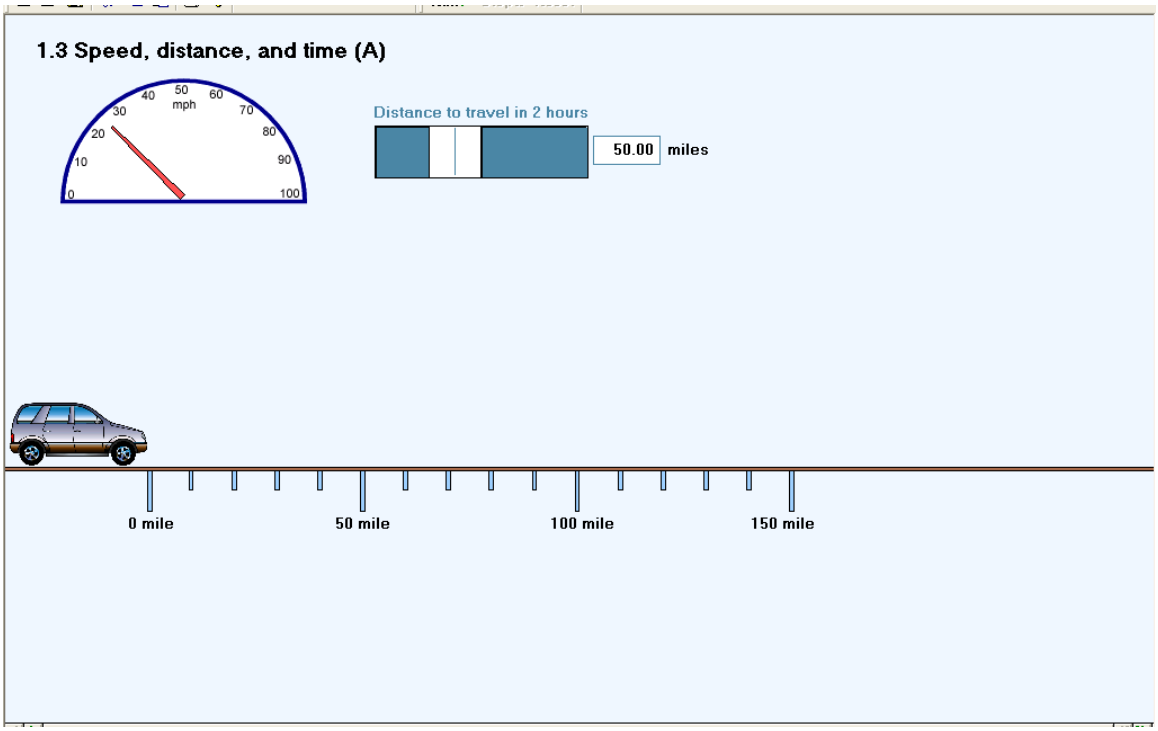
Create presentation for class describing the equation form that goes with one of the 5 simulations.

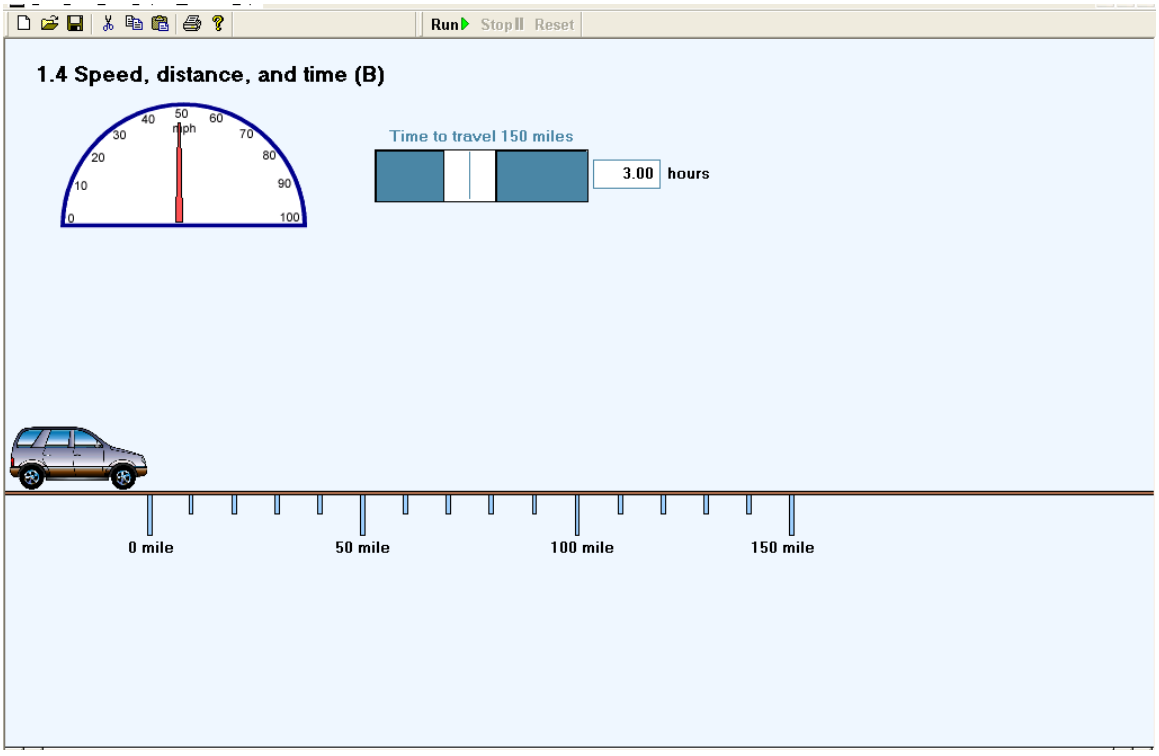
Closing: Students will present their understandings to the class stating why a screen is in a particular form, how did they figure it out.

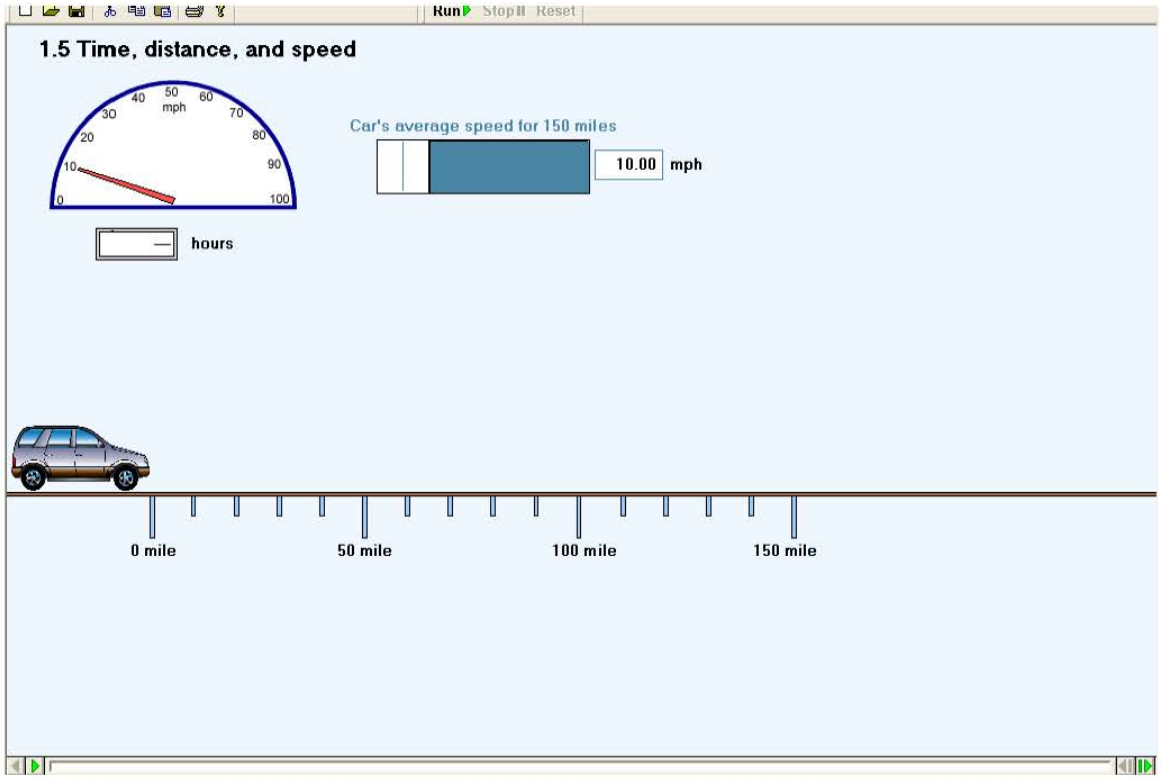
Interactive Physics Simulation to be Used






1.3 Speed, distance, and time (A)
0
10
20
30
40
50
mph
60
70
80
90
100
Distance to travel in 2 hours
50.00
miles
0 mile
50 mile
100 mile
150 mile


Run
Stop
Reset
1.4 Speed, distance, and time (B)
0
10
20
30
40
50
mph
60
70
80
90
100
Time to travel 150 miles
3.00
hours
0 mile
50 mile
100 mile
150 mile


Run
Stop
Reset
1.5 Time, distance, and speed
0
10
20
30
40
50
mph
60
70
80
90
100
hours
Car's average speed for 150 miles
10.00
mph
0 mile
50 mile
100 mile
150 mile