Velocity and Acceleration WebQuest

* Click on the underlined phrase to link to the web page to watch the animation. Then, use that to answer the questions.

Part I. Direction of Velocity and Acceleration

Directions: Watch the Hot Wheels Car Animation at (http://www.physicsclassroom.com/mmedia/kinema/avd.cfm)

1. What is the RULE OF THUMB for velocity and acceleration (look in yellow box)?

2. When an object is speeding up to the right, what direction is the acceleration?

3. When an object is turning a corner, what direction is the acceleration?

4. When an object is moving to the left and slowing down, what direction is the acceleration?

5. Accelerating objects have a changing velocity - either due to a speed change or a direction change. Considering east as a positive direction and west as negative direction, complete the table below by writing the direction of each variable as an arrow.

Situation	Velocity	Acceleration
Speeding up going east		
Speeding up going west		
Slowing down going east		
Slowing down going west		

Watch the Racing Skiers animation: http://www.upscale.utoronto.ca/GeneralInterest/Harrison/Flash/ClassMechanics/RacingSkiers/RacingSkiers.html

6. Explain why the blue skier made it to the finish line first.

Part II. Constant Velocity versus Acceleration.

Watch the animations:
** Constant Velocity** http://www.physicsclassroom.com/mmedia/kinema/cpv.cfm
** Constant Acceleration** http://www.physicsclassroom.com/mmedia/kinema/pvpa.cfm

7. Sketch the position (distance), velocity, and acceleration graphs for each of these motions.

8. What is obtained by calculating the slope of a:
a. position (distance)-time graph?
b. velocity-time graph?

Watch the Car Animation http://www.physicsclassroom.com/mmedia/kinema/acceln.cfm

9. Which car or cars (red, green, and/or blue) are undergoing an acceleration?

10. How can you tell the difference in motion?

11. Look at the Position-Time graphs of each of the cars.
a. Match the appropriate line to the particular color of car.

Watch The Stoplight http://www.physicsclassroom.com/mmedia/kinema/stl.cfm

A blue car moving at a constant speed of 10 m/s passes a red car that is at rest. This occurs at a stoplight the moment that the light turns green. The red car accelerates from rest at 4 m/s^2 for three seconds and then maintains a constant speed.

12. At what speed does the red car travel after 3 seconds?

13. When lines on a velocity-time graph intersect, does this mean that the two cars are passing by each other? If not, what does it mean?