Momentum Scavenger Hunt

Physical Science and Technology

Answer the following questions in full sentences on your own sheet of paper. Provide definitions in your own words where requested and include drawings or diagrams where indicated. When a question asks you to do internet research, you are welcome to use any search tool or on-line resource you'd like – but be aware that some sites (like Wikipedia) could possibly have information that is not completely accurate.

1. According to your internet research, what is the definition of momentum?
2. In YOUR OWN WORDS, what is momentum?
3. According to your internet research, what is "transfer of momentum"?
4. In YOUR OWN WORDS, describe transfer of momentum.
5. Draw a diagram or a cartoon that illustrates the transfer of momentum from one object to another. Label your drawing so that it is clear when and where the transfer of momentum takes place.
6. What is the formula for momentum if you know the mass and velocity of an object?
7. According to your internet research, what do you think would happen if a very fast object with a very small mass struck a motionless object that had a very large mass?
8. Draw a diagram or cartoon that illustrates your answer to question 7. Label your drawing so that it is clear what happens before and after the objects collide.
9. Go to the following web site: http://faraday.physics.utoronto.ca/PVB/Harrison/Flash/ClassMechanics/AirTrack/AirTrack.html (also available at http://www.upscale.utoronto.ca/PVB/Harrison/Flash/ClassMechanics/AirTrack/AirTrack.html) and try the simulation. After you have figured out how the simulation works, complete the following data table by running the simulation six times with different parameters:

Type of Collision:	Mass of Second Cart:	Velocity of First Cart After Collision:	Velocity of Second Cart After Collision:
Elastic	0.7 kg		
Elastic	1.0 kg		
Elastic	1.4 kg		
Inelastic	0.7 kg		
Inelastic	1.0 kg		
Inelastic	1.4 kg		

10. Write a paragraph of at least five sentences that compares and contrasts the velocities of the two carts in the different collisions. In your paragraph, make sure you address the following questions by specifically referring to the concepts of momentum and transfer of momentum:
    a. Why does the second cart move more quickly than the first cart sometimes and more slowly than the first cart sometimes?
    b. Why does the velocity of the first cart slow down when there is an inelastic collision?
    c. What do you think would happen if the mass of the second cart were increased to 10000kg?
    d. How does this simulation help you understand how your momentumometer will work?