Newton's Laws Webquest: Student Handout

Part I:

1. What is "inertia"?

2. A truck is traveling to the right and is carrying a ladder on its roof, which is not securely attached. When the truck slams on its brakes, do you think the ladder will:
    a. Stay on the truck
    b. Slide backwards off the back of the truck
    c. Slide forwards off the front of the truck
    d. Fly up into the air

3. Watch the Truck and Ladder animation by clicking this link: http://www.physicsclassroom.com/mmedia/newtlaws/il.cfm Describe and explain the motion of the ladder using Physics terms.

4. An airplane is flying eastward at 200 m/s when it drops a package out of the bottom. Do you think the package will land:
    a. Behind the airplane
    b. Directly beneath the airplane
    c. In front of the airplane
    d. The package will not land, it will fly along directly beneath the airplane.

5. Watch the Airplane Animation by clicking this link: http://www.physicsclassroom.com/mmedia/vectors/pap.cfm Explain why the package landed where it did using the concept of inertia.

Part II

1. Watch the Construction of Free Body Diagrams by clicking this link: https://www.wisc-online.com/learn/natural-science/physics/tp1502/construction-of-free-body-diagrams When you get to Slide #2, define "Free Body Diagram" in your own words in your notes. Did you write the definition in your notes?

2. When you get to slide #4, write down the four steps for constructing a FBD in your notes. Did you write the steps in your notes?

3. When you get to slide #8, copy the example into your notes. Did you copy the example into your notes?

4. The force of the table pushing on the bag of groceries is known as the "Normal Force". The Normal Force is the contact force with which a surface pushes on an object, it is always perpendicular to the surface. Write the definition for "Normal Force" and its direction in your notes. In the grocery bag example, which of the following is equal to the Normal Force?

5. Finish the rest of the tutorial, including the practice problems. Copy any one of these examples into your notes. Did you finish the tutorial and copy an example into your notes?

Part III

You be using the following link to complete this Webquest: http://www.physicsclassroom.com/Class/newtlaws/u2l3a.cfm

1. Begin by reading the first two paragraphs and the two red concept maps. Which of the following describes a way in which an object can accelerate? Circle all that apply.
    a. Speeding up
    b. Slowing down
    c. Changing direction
    d. Turning at a constant speed

2. Copy the two red concept maps into your notes, side-by-side. Did you copy both maps into your notes?

3. Continue reading up to the first "Quick Quiz". Describe Newton's 2nd Law in your own words, both in the box below and in your notes. Also record the equation for Newton's Second Law in your notes.

4. How is the "NET force" calculated? Copy your explanation into your notes.

5. Follow the link in the tutorial by clicking the words "As discussed in an earlier lesson". Read through this lesson. Below, describe how you can use a Free Body Diagram to determine the Net Force on an object.

6. Describe a situation in which the Net Force on acting on an object is equal to zero. For your example, you should describe all the forces involved and explain why the Net Force is zero.

7. Return to the Newton's Second Law lesson. Continue reading up to the second "Quick Quiz." If the net force on an object is doubled, then the acceleration of that object will:

8. Fill in the blank for the following sentence. Copy this sentence into your notes. The direction of the net force is always in the _____ direction as the acceleration.

9. Finish reading through the lesson. In your notes, create a circle chart to show the relationship between net force, mass, and acceleration. When you are done, ask your teacher if you have correctly created the circle chart.

10. A net force of 15 N is exerted on an encyclopedia to cause it to accelerate at a rate of 3 m/s2. Determine the mass of the encyclopedia.

11. A speedboat is towing a 70 kg person. If the person is accelerating at a rate of 2 m/s2, what is the net force acting on the person?