Forces - Newton's 3 Laws
Homework Worksheet

HW 1

1) Name the force that best describes the following:

_____ a) the weakest force
_____ b) the force(s) that act over the longest distance
_____ c) the strongest force
_____ d) the force that holds matter together
_____ e) the force caused by moving electrical charges
_____ f) often called the mechanical force
_____ g) controls the radioactive decay of atoms
_____ h) is transmitted by gluons
_____ i) is transmitted by intermediate vector bosons

2) A physics book is motionless on the top of a table. If you give it a hard push with your hand, it slides across the table and slowly comes to a stop. Use Newton's first law of motion to answer the following questions:
a) Why does the book remain motionless before the force is applied?
b) Why does the book move when he hand pushes on it?
c) Why does the book eventually come to a stop?
d) Under what conditioins would the book remain in motion at a constant speed?

3) Why do you have to push harder on the pedals of a single-speed bicycle to start it moving then to keep it moving with a constant velocity?

4) You place a carton on a hand cart. When you accelerate the cart, the carton also accelerates. What supplies the force that accelerates the carton?

5) Why does a package on the seat of a bus slide backward when the bus accelerates quickly from rest? Why does it slide forward when the driver applies the brakes?

6) Which force makes paint cling to a wall? Which force makes adhesive sticky? Which force makes wax stick to a car?

7) If you are in a car that is struck from behind, you can receive a serious injury called whiplash.
a) Using Newton's laws of motion, explain what happens.
b) How does a headrest reduce whiplash?