JBS Introduction to Physics Name: _____ Number: _____

Objectives for Unit #3: Forces

You should be able to do the following:

1. Explain what a force is.
2. Identify several causes of forces.
3. Distinguish between contact and non-contact forces. Given examples of forces, identify them as contact or non-contact forces.
4. Identify the most common units of force.
5. Define a *Newton*.
6. Compare a pound to a newton.
7. Represent forces by sketching them as vectors. Given the value of forces (say a force of 5 Newtons up and a force of 10 Newtons to the right) sketch vectors with a ruler to represent the forces.
8. Explain whether forces created by ropes (tension) and springs can be both pulling and pushing or just pulling.
9. Using a spring, distinguish between extension and compression.
10. Distinguish between mass and weight. Which one is a force?
11. Explain what happens to weight on different planets and on the moon.
12. Use the relationship (and its variations, W = mg, to calculate weight, strength of gravity and mass.
13. Explain why two surfaces try to slide past each other they experience a force of friction.
14. If two surfaces are repeatedly rubbed against each other (as in two pieces of sandpaper rubbing against each other), explain what will happen to the force of friction.
15. Explain why water and oil can reduce the friction between surfaces.
16. Distinguish between static friction and sliding friction.
17. Look at figure 5.10 in your text. Explain why adding a brick to the piece of paper increases the friction between the paper and the table.
18. Describe some "inventions" that work by decreasing friction; describe some "inventions" that work by increasing friction.
19. Describe the relationship between friction, the energy of motion, and heat.
20. Be able to solve problems to calculate the value of forces in a situation (see your handouts and text for examples).
21. Explain what it means for an object's motion if the net force is zero or it the net force is not zero.
22. Explain what "normal" means in the phrase "normal force." Solve problems to calculate the size of a normal force (See your handout on Practice with Normal Force for sample problems).
23. Explain how a brick sitting on a table could be similar to the same brick sitting on a spring.
24. Given various situations, draw an appropriate free-body diagram. Include forces of gravity, tension, friction, normal forces, and applied forces.
25. Review all the activities we have done regarding force:
    a. Using a spring scale
    b. The relationship between mass and weight (what is the slope of this graph on earth?).
    c. Calculating net force
    d. Relationship between weight (mg) and the change in length of a spring.
    e. Observing normal forces: a brick on one meterstick v a brick on six meter sticks.
    f. Creating a force of tension (using a pulley).
    g. Relationship between weight of a box on table and the force of friction
    h. Observing non-contact forces: electrostatic forces and magnetic forces.
26. Given a graph of weight and the change in length of a spring, predict which spring will be easier to pull; which will stretch more given the same amount of mass. (Look at your practice sheet on this topic.)
27. Identify some common everyday objects that utilize springs to create pushing and pulling forces.
28. Look at all the binder pages you have completed for this unit.

Your textbook has many useful practice problems at the end of each chapter. Use this table to practice for your test. I have selected the questions appropriate for your test.

Section	Chapter 5
Vocabulary	1 - 14
Concepts	1, 3-25
Problems	2-18
Applying your Knowledge	2, 3 & 6

Don't forget to try and review the section reviews (5.1, 5.2 and 5.3) for the pages we have read.