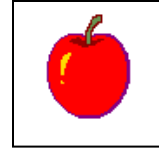


Name \_\_\_\_\_ Hour \_\_\_\_\_

\_\_\_\_\_ points, DUE \_\_\_\_\_

## Forces Book Assignment



**Use Chapter 4 of your text book to answer the following questions.**

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### SECTION 4-1: FORCE AND MOTION (p. 90)

1. What is a force? Give two examples.
2. What unit is force measured in? \_\_\_\_\_ abbreviation for unit: \_\_\_\_\_
3. Force is a vector. What is a vector again? **(Not from book)**
4. Every vector has 2 components. Let's say you push your little sister with a force of 20 Newtons at  $30^\circ$  N of E. Find the two components of that vector. **In other words, set up a right triangle and find  $F_x$  and  $F_y$ .** (ans. 17.3 N and 10N) **(Not from book)**
5. What is a **free-body diagram**? (p. 92)
6. Draw the free body diagram for your hand holding an apple. There should be 2 arrows, one for gravity, and one for your hand. (See p. 92 for help)
7. What is another term for the sum of all forces? \_\_\_\_\_

### Newton's 2<sup>nd</sup> Law (p. 95-96):

8. What is Newton's 2<sup>nd</sup> Law? **Write it solved for F.** List what each variable is and what unit it is measure in.
9. What other unit is a Newton equal to? (Last paragraph p. 95)

### Use Newton's 2<sup>nd</sup> Law ( $F = m \times a$ ) to solve the following problems.

10. Find a car's acceleration if it has a mass of 1,000 kg and has a force of 2,000 N acting on it.  
(ans.  $2 \text{ m/s}^2$ )
11. If you increase the force applied, what should happen to the acceleration? \_\_\_\_\_
12. If you increase the mass of the object, what should happen to the acceleration? \_\_\_\_\_

### Newton's 1<sup>st</sup> Law (p. 98):

13. What does **Newton's 1<sup>st</sup> Law** state?

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14. Newton's 1<sup>st</sup> law is also known as the law of \_\_\_\_\_  
15. Define **inertia**.

16. What is **equilibrium**?

17. What are the 2 times an object can be in equilibrium? (See picture at top of page)

**Weight and Drag Force (p. 100):**

18. Define weight:

19. What unit is weight measured in? \_\_\_\_\_  
20. What is the equation we use to find weight? \_\_\_\_\_  
21. Calculate the force you exert on the earth, (your weight in N) if you have a mass of 60 kg.  
**(The acceleration here is the acceleration due to gravity. The earth pulls down giving you weight)** (ans. -588 N)

22. What is the difference between mass and weight? Would your weight change on the moon? Mass? **(Not stated in book: Apply what you know about weight and mass)**

23. What is drag force?

24. Drag force would be an example of \_\_\_\_\_ -which is the force that opposes motion.

25. What is **terminal velocity**?

26. Should lighter or heavier objects reach terminal velocity faster? Why?

**Newton's 3<sup>rd</sup> Law (p. 106):**

27. What is an interaction pair? What is another name for it?

28. What is Newton's 3<sup>rd</sup> Law? Use the last paragraph on p. 106.

29. You hit the head of a nail with a hammer. **(Not in book)**  
a. Does the nail or hammer experience greater force or is it the same? Explain.  
  
b. Which would experience the greater acceleration? Explain.