Newton’s 2nd Law Practice Problems Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2nd Law Formula: F =

When rearranged… m = a =

***Use Newton’s second law to solve for force, mass, and acceleration.***

***Give the equation used for each problem and show all work.***

1. What net force is required to accelerate a car at a rate of 2 m/s2 if the car has a mass of 3,000 kg?

F=\_\_\_\_\_\_\_

m=\_\_\_\_\_\_

a= \_\_\_\_\_\_\_

2. A10 kg bowling ball would require what force to accelerate down an alleyway at a rate of 3 m/s2?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

3. Sally has a car that accelerates at 5 m/s2. If the car has a mass of 1000 kg, how much force does the

car produce?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

4. What is the mass of a falling rock if it produces a force of 147 N?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

5. What is the mass of a truck if it produces a force of 14,000 N while accelerating at a rate of 5 m/s2?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

6. What is the acceleration of softball if it has a mass of 0.5 kg and hits the catcher's glove with a force of 25 N?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

7. Your own car has a mass of 2000 kg. If your car produces a force of 5000 N, how fast will it accelerate?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

8. Sally wants to accelerate even faster than in problem #3, so she removes 500 kg of mass from her car. How fast will her 1500 kg car accelerate if it produces 5000 N of force?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

9. Sally challenges you to a race. On the first turn you run off the course and your car strikes a large bale of hay. Your car still produces 5000 N of force, but now it accelerates at only 2 m/s2. What is the mass of your car now that the bale of hay is stuck to it?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_

10. Even though she is way ahead of you, Sally switches her car to run on nitrous oxide fuel. The nitrous oxide allows her car to develop 10,000 N of force. What is Sally's acceleration if her car has a mass of 500 kg?

F=\_\_\_\_\_\_

m=\_\_\_\_\_\_

a=\_\_\_\_\_\_