Name: _____ Date: _____ Hour: _____

Newton's Second Law Practice Problems
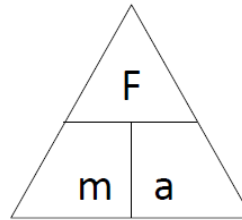
For each of the following problems…

Solve for Force (F)   OR/

Solve for Mass (m)   OR/

Solve for Acceleration (a)

using the formula **F=ma**.

$$\begin{array}{c} F \\ \hline m \mid a \end{array}$$

Examples Provided…

Scroll to See More!

Remember to show all work. Write down the formula each time, plug-in the numbers, and solve for the final answer. Circle your answer (remember units).

1. A man hits a golf ball (0.2 kg) which accelerates at a rate of 20 m/s². What amount of force acted on the ball?

   F = ?
   m = 0.2 kg   F = m x a   F = 0.2 x 20   F = 4 N
   a = 20 m/s²

2. What is the acceleration of a 10 kg object if a force of 3 N is applied to it?

   F = 3 N
   m = 10 kg $a = \dfrac{F}{m}$ $a = \dfrac{3}{10}$ a = 0.3 m/s²
   a = ?

3. You give a shopping cart a shove down the aisle. The cart is full of groceries and has a mass of 18 kg. The cart accelerates at a rate of 3 m/s². How much force did you exert on the cart?

4. The wind pushes a paper cup along the sand at a beach. The cup has a mass of 0.025 kilograms and accelerates at a rate of 5 m/s². How much force is the wind exerting on the cup?

5. You push a friend sitting on a swing. She has a mass of 50 kg and accelerates at a rate of 4 m/s². Find the force you exerted.

6. How much force would it take to push another, larger friend who has a mass of 70 kg to accelerate at the same rate of 4 m/s²?

7. What is the acceleration of a 0.3 kg ball hit with a force of 20 N?

8. What is the mass of an object if a force of 34 N produces an acceleration of 4 m/s/s?

$$F = 34 \text{ N}$$
$$m = ?$$
$$a = 4 \text{ m/s}^2$$
$$m = \frac{F}{a}$$
$$m = \frac{34}{4}$$
$$m = 8.5 \text{ kg}$$

9. What force is needed to accelerate a 1,000 kg car at a rate of 35 m/s/s?

10. What force is required to accelerate a 5 kg object to 6 m/s/s?

11. What is the mass of an object if a force of 17 N causes it to accelerate at 1.5 m/s/s?

12. What is the mass of an object that requires a force of 25 N to accelerate at 5 m/s/s?

13. How much force is required to accelerate an 1,800 kg truck at 3 m/s/s?