

# CALCULATING FORCE WORKSHEET

Calculate the force in the following problems by using the equation:

$$\text{Force} = \text{mass} \times \text{acceleration} \qquad \mathbf{F = m \times a}$$

Be sure to (1) ALWAYS write the equation, (2) plug in the numbers and units, and (3) give the answer with the correct units.

1. A man hits a golf ball (0.2 kg) which accelerates at a rate of  $20 \text{ m/s}^2$ . What amount of force acted on the ball?
2. 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  $3 \text{ m/s}^2$ . How much force did you exert on the cart?
3. The wind pushes a paper cup along the sand at a beach. The cup has a mass of 25 grams (= ? kg) and accelerates at a rate of  $5 \text{ m/s}^2$ . How much force (in Newtons) is the wind exerting on the cup?
4. You push a friend sitting on a swing. She has a mass of 50 kg and accelerates at a rate of  $4 \text{ m/s}^2$ . Find the force you exerted.
5. 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  $4 \text{ m/s}^2$ ?
6. A worker drops his hammer off the roof of a house. The hammer has a mass of 9 kg, and gravity accelerates it at the usual  $9.8 \text{ m/s}^2$ . How much force does the earth apply to the hammer?
7. A car whose mass is 1000 kg is traveling at a constant speed of 10 m/s. Neglecting any friction, how much force will the engine have to supply to keep going the same speed? (tricky question) (think INERTIA) (look at the units)