## CONCEPTUAL Physical Science PRACTICE SHEET

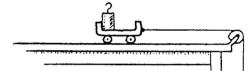
## Chapter 2: Newton's Laws of Motion Dropping Masses and Accelerating Cart—continued

(b) Find the acceleration of the 1-kg cart when three identical 10-N weights are attached to the string.

$$a = \frac{F}{m} = \frac{\text{unbalanced force}}{\text{total mass}} = \frac{m/s^2}{m}$$

(c) Find the acceleration of the 1-kg cart when four identical 10-N weights (not shown) are attached to the string.

$$a = \frac{F}{m} = \frac{\text{unbalanced force}}{\text{total mass}} = \frac{m}{s^2}$$



(d) This time 1 kg of iron is added to the cart, and only one iron piece dangles from the pulley. Find the acceleration of the cart.

$$a = \frac{F}{m} = \frac{\text{unbalanced force}}{\text{total mass}} = \frac{m/s^2}{s}$$

The force due to gravity on a mass m is mg. So gravitational force on 1 kg is  $(1 \text{ kg})(10 \text{ m/s}^2) = 10 \text{ N}$ .

(e) Find the acceleration of the cart when it carries 2 pieces of iron and only one iron piece dangles from the pulley.

$$a = \frac{F}{m} = \frac{\text{unbalanced force}}{\text{total mass}} = \frac{m/s^2}{\sqrt{2}}$$