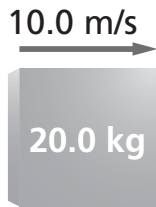


# Kinetic Energy

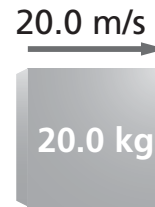
①



$$KE = \frac{1}{2}mv^2$$

$$KE = \frac{1}{2}(20.0 \text{ kg})(10.0 \text{ m/s})^2 = 1.00 \times 10^3 \text{ J}$$

②



$$KE = \frac{1}{2}mv^2$$

$$KE = \frac{1}{2}(20.0 \text{ kg})(20.0 \text{ m/s})^2 = 4.00 \times 10^3 \text{ J}$$

When velocity doubles then *KE* increases by a factor of 4.  
(Compare to 1)

③

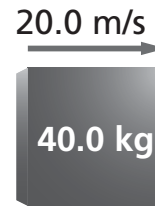


$$KE = \frac{1}{2}mv^2$$

$$KE = \frac{1}{2}(40.0 \text{ kg})(10.0 \text{ m/s})^2 = 2.00 \times 10^3 \text{ J}$$

When mass doubles then *KE* doubles. (Compare to 1)

④



$$KE = \frac{1}{2}mv^2$$

$$KE = \frac{1}{2}(40.0 \text{ kg})(20.0 \text{ m/s})^2 = 8.00 \times 10^3 \text{ J}$$

When mass and velocity both double the *KE* increases by a factor of 8. (Compare to 1)

# 11 Transparency 11-1 Worksheet

## Kinetic Energy

1. In the equation shown, what does  $KE$  stand for?  
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2. In the equation shown, what does  $m$  stand for?  
\_\_\_\_\_
3. In the equation shown, what does  $v$  stand for?  
\_\_\_\_\_
4. Look at Figure 2. When the velocity of the object in Figure 1 doubles, by how much does the kinetic energy increase? Why?  
\_\_\_\_\_  
\_\_\_\_\_
5. If the velocity of the object in Figure 2 increased to 30 m/s, what would be the new kinetic energy?  
\_\_\_\_\_  
\_\_\_\_\_
6. Look at Figure 3. When the mass of the object in Figure 1 doubles, by how much does the kinetic energy increase? Why?  
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\_\_\_\_\_  
\_\_\_\_\_
7. If the mass of the object in Figure 3 increased to 60 kg, what would be the new kinetic energy?  
\_\_\_\_\_  
\_\_\_\_\_
8. When the mass and velocity of the object in Figure 4 both double, by how much does the kinetic energy increase? Why?  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_