

Name: _____

Notes - 4.4 Newton's Third Law of Motion: Symmetry in Forces

1. State Newton's 3rd Law of Motion.
2. Forces always occur in pairs, and one body cannot exert a force on another without _____ . This is sometimes referred to as action-_____.
3. Consider the swimmer pushing off from the side of a pool in Figure 4.9. She pushes against the pool wall with her feet and accelerates in the direction opposite to that of her push. The wall has exerted an equal and opposite force back on the swimmer. Why does the swimmer accelerate? Don't these two forces cancel each other out?
4. Describe some other examples of Newton's 3rd Law.

Walking:

Car:

Helicopter:

5. Rockets
 - A. What is the common misconception regarding rocket propulsion? What is the reality?
 - B. What observation disproves this misconception?

Notes - 5.1 Friction

1. What is friction?
2. When there is relative motion between objects in contact, the friction is called _____ friction. Its symbol is _____.
3. When there is no motion between objects in contact, the friction is called _____ friction. Its symbol is _____.
4. The harder two objects are pushed together, the _____ the friction becomes.
5. Write the equation for the magnitude of static friction.
6. Write the equation for the magnitude of kinetic friction.
7. Looking at Table 5.1, which coefficient of friction is greater, static or kinetic?
8. From Table 5.1, give the three highest examples of the coefficient of static friction.
9. From Table 5.1, give the three lowest examples of the coefficient of kinetic friction.
10. A skier is sliding along a horizontal field of snow. If the overall mass of the skier plus her skis is 62kg, and if she is experiencing a 30N force of friction, what is the coefficient of friction between the skis and the snow? Is this static or kinetic friction?