Name _____ **Date** _____ **Period** ____

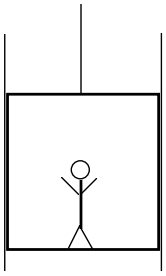
UNIT 5 Practice Problems

Directions: Be sure to draw a force diagram even if the problem doesn't ask for one and show all work.

1. A 20 g sparrow flying toward a bird feeder mistakes the pane of glass in a window for an opening and slmas into it with a force of 2.0 N. What is the bird's acceleration?

2. A 30.0 g arrow is shot by William Tell through an 8.0 cm thick apple sitting on top of his head. If the arrow enters the apple at 30.0 m/s and emerges at 25.0 m/s in the same direction, with what force did the apple resist the arrow?

3. An elevator is moving up at a constant velocity of 2.5 m/s, as illustrated in the diagram below: The man has a mass of 85. kg.



   a. Construct a force diagram for the man.

   b. What force does the floor exert on the man?

4. The elevator now accelerates upward at 2.0 m/s^2.

   a. Construct a force diagram for the man.

   b. What force does the floor now exert on the man?

5. Upon reaching the top of the building, the elevator accelerates downward at 3.0 m/s^2.

a. Construct a force diagram for the man.

b. What force does the floor now exert on the man?

6. While descending in the elevator, the cable suddenly breaks. What is the force of the floor on the man? __

7. Consider the situation where a person that has a mass of 68 kg is descending in an elevator at a constant velocity of 4.0 m/s. At some time "t", the elevator starts to slow to a stop at the rate of 2.0 m/s^2. What is the magnitude of the net force acting on the person in the elevator when it is descending but accelerating to a stop?

8. If the person in the elevator were standing on a bathroom scale calibrated in newtons, what would the scale read while the elevator was slowing to a stop?

9. Rose is sledding down an ice covered hill that in inclined at 15° above the horizontal. If Rose and the sled have a combined mass of 54.0 kg, A) What is the net force pulling her down the hill? B) What is her rate of acceleration?