PHYSICS IN MOTION

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Unit 3C
Newton's Second Law Part 1
Practice Problems

Name:

Date:

Work each of the following problems. SHOW ALL WORK.

1. A 200 N net force acts on a 50 kg box. What is the acceleration of the box?

2. A 1200 kg car accelerates at 3 m/s². What net force is the car experiencing during this acceleration?

3. What is the weight of a 20 kg object on earth?

4. A 40 N force is applied to a 10 kg block, but the object only accelerates at 2 m/s². Explain why this happens using a free-body diagram.

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5. A 25 kg block is pulled with an applied force of 200 N across a horizontal surface. The block experiences a frictional force of 75 N.

    a. Draw a free-body diagram for the block, including all forces acting on the block.

    b. Determine the net force acting on the block.

    c. Calculate the acceleration of the block.

6. What normal force does a horizontal table exert on a 3.5 kg book that sits at rest? **Be sure to draw a free-body diagram.**

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7. A football blocking sled has a mass of roughly 100 kg. If a football player applies a force of 500 N to the sled, and there is a 350 N frictional force acting on the sled, what is the acceleration of the sled? *Be sure to draw a free-body diagram.*

8. A 1000 kg elevator is accelerated upward at a rate of 0.70 m/s^2. What is the tension in the cable pulling the elevator upward when it experiences this acceleration? *Be sure to draw a free-body diagram.*