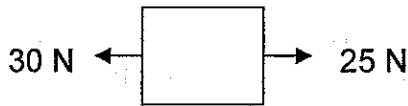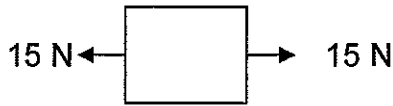## Newton's Laws of Motion

1. Which of Newton's Three Laws Applies?

   _____ When you put a book on a table the table pushes on the book.

   _____ A person is pushed forward into their seatbelt when a car stops.

   _____ A larger car takes more force to move.

   _____ A person leans on a wall and the wall pushes back.

   _____ A brick sits on a table until you push on it.

2. Understanding Net Force (Right is possible, left is negative)

|  | What is the net force? | Which way will the block move? |
|---|---|---|
| 30 N ← [ ] → 25 N | _____ | _____ |
| 5 N ← [ ] → 12 N | _____ | _____ |
| 15 N ← [ ] → 15 N | _____ | _____ |

3. Matching:

   a. Inertia    _____

   b. Mass    _____

   c. Net Force _____

   d. Gravity    _____

   e. Force    _____

   1. An action that can cause motion

   2. Force pulling all objects toward each other

   3. The amount of matter in an object

   4. Ability of an object to resist change of motion

   5. Total of all the forces on an object

# Newton's Laws

The following are some problems which involve net force and Newton's second law. Use force/FBD diagrams when applicable.

1. What is the net force on an object if it has a mass of 101.5 kg and experiences an acceleration of 5.0 m/s²?

2. If a boy exerts a force of 10 N on a wagon to the right, and a girl exerts the same amount of force on the wagon to the left, what is the net force applied to the object?

3. If a force of 200N applied to an object is opposed by a force of 150N, what is the net force? What acceleration will this object experience if it has a mass of 25 kg?

4. John can exert a force of 900N to push a box; Mary can exert a force of 650N, Paul 1000N. What is the net force acting on a large box which has John and Mary pushing on one side, and Paul pushing the other direction?

5. If the box above has a mass of 500kg, what acceleration does it experience while John, Paul, and Mary push on it?

6. A man weighs himself on a scale and it reads 700N (on Earth). What net force would make him experience an acceleration of 2.0 m/s² (remember: weight = Fg = mg)?

7. A car of mass 1000kg travels down the road and encounters a stop sign for which it must experience an acceleration of 5.0 m/s² in order for it to stop in time. What is the braking force required to stop the car?