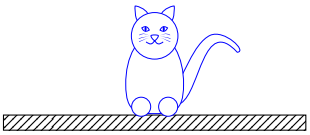
Name: Date: Period:

Free-Body Diagram Practice

1. A cat sits at rest on the top of a table.
   (a) Will the forces on the cat be balanced or unbalanced? How do you know?

   (b) Draw the free body diagram.
   Make sure to include the net force.



   (c) If the cat's weight (that is, force of gravity) is 90 Newtons, what is the normal force acting on the cat?

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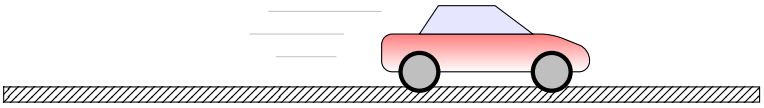
2. A car is moving east along the interstate **at a constant speed**.
   (a) Will the forces on the car be balanced or unbalanced? How do you know?

   (b) Draw the free body diagram.
   Make sure to include the net force.



   (c) The car has an applied force of 700 Newtons. Find the magnitude of the force of **friction**.

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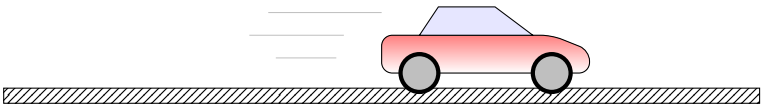
3. The same car is now **accelerating forward**.
   (a) Will the forces on the car be balanced or unbalanced? How do you know?

   (b) Draw the free body diagram.
   Make sure to include the net force.



   (c) The frictional force is the same as in the last problem, but this time, the car has an applied force of 900 Newtons. Calculate the **net force**.

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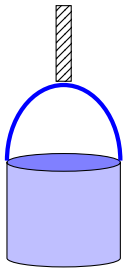
4. You are lifting a bucket with a rope. The force on the rope is 45 Newtons and the bucket has a weight (that is, force of gravity) of 23 Newtons.

   (a) Draw the free body diagram.
   Make sure to include the net force.



   (b) Calculate the **net force** on the bucket.

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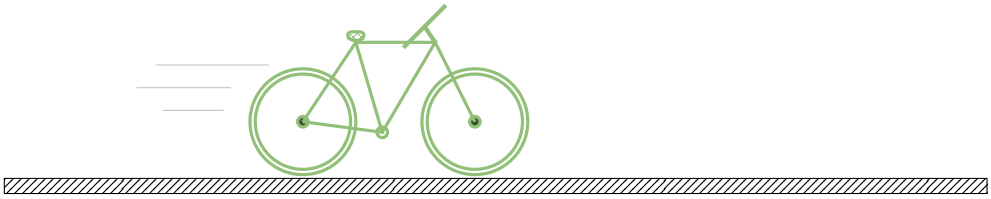
5. The net force acting on a bicycle is 14 N. The friction experienced by the bicylce is 52 N.

   (a) Draw a free body diagram.



   (b) Calculate the **applied force** on the bicycle.

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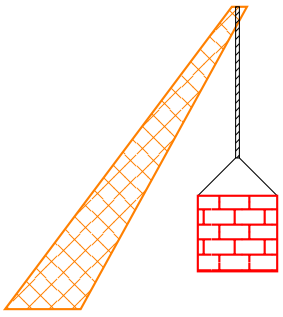
6. A large load has a weight (that is, force of gravity) of 12 000 N. It is being lifted by a crane.

   (a) Draw a free body diagram.



   (b) The net force is 1500 N upward. Calculate the **tension** being provided by the crane.