



Lesson Question



Lesson Goals

Describe the concept of



Explain how to determine the net force on an



Distinguish

between balanced and unbalanced forces and their effects on



Words to Know

Write the letter of the definition next to the matching word as you work through the lesson. You may use the glossary to help you.

_____ magnitude

_____ force

_____ friction

_____ gravity

_____ normal force

_____ vector

A. a resistance to motion caused by two surfaces rubbing against each other

B. the size or quantity of something

C. a push or pull

D. the support force a surface exerts on an object; always at a ninety-degree angle to the surface a push or pull

E. a quantity that has both a size and a direction

F. the force that one massive object exerts to attract another object to it; expressed as the weight of an object

**Motion**

- Motion is recognized when an object's from a reference point changes.
- Motion can be described by:
 - a .
 - a .
 - an .

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Forces

- A is a push or a .
- Forces are .
 - A vector has both a magnitude and a .
 - is the size or quantity of something.
 - A vector is indicated with an .
 - A vector can have a positive or value.
- Forces are measured in (N).

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Force Diagrams and Abbreviations

- A force diagram is a drawing with force whose sizes and directions represent the magnitudes and directions of the forces acting on an object. Abbreviations are used to identify which type of force each vector represents.
 - The of a force vector represents the magnitude, or size, of the force.
 - The of the force vector shows which direction the force is acting in and abbreviations to tell you what type of force each vector represents.

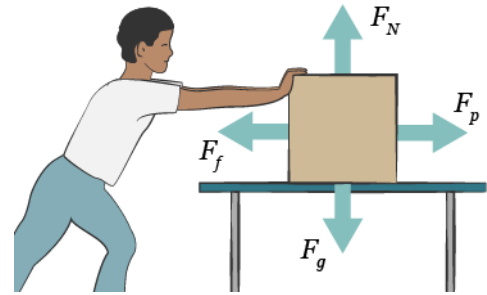
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Force Diagrams and Abbreviations

• Some common forces are:

- Push or pull,
- force, F_N : always at a -degree right angle
- Friction, : slows object down
- , F_g : weight



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Words to Know

counteract	to act against something, causing it to have <input type="text"/> of an effect
net force	the <input type="text"/> of all of the forces acting on an object

Multiple Forces

- Forces that act in the same direction .
- Forces that act in opposite directions each other.

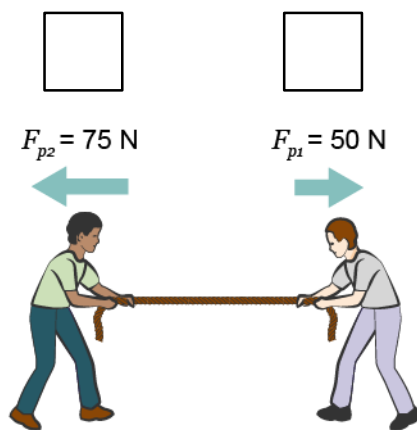
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Net Force

- The net force is the sum of all of the that act on an object.
- Positive and negatives have to be assigned for before adding forces together.
- When assigning positives and negatives to forces, forces pointing to the are positive, and forces pointing to the are negative.

Label the forces shown as positive (+) or negative (-).



- The net force in the illustration is .

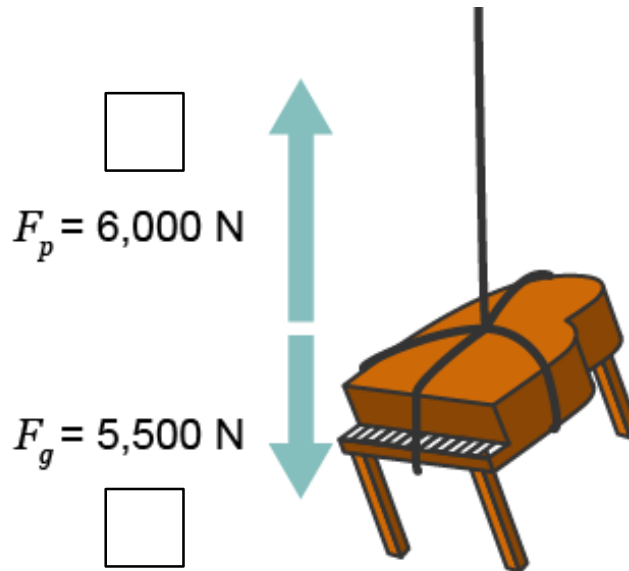
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Parallel Forces

- Only forces can be added together.
- Left and can be added together.
- Up and can be added together.

Label the forces shown as positive (+) or negative (-).



- The sum of the forces acting on this piano is .

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Balanced Forces

- When forces acting in directions are exactly equal:
 - The net force is .
 - There is no change in .
 - It's important to know that a zero net force does mean there is no motion. It simply means that there is no change from what is already happening.

Unbalanced Forces

- When forces acting in opposite directions are :
 - The net force is positive or negative in the direction of the force.
 - There is a change in .
 -
 -
 - Both speed and direction
 - The motion of the object is in the same as the net force.
- Unbalanced forces can start an object moving or stop an object from moving.

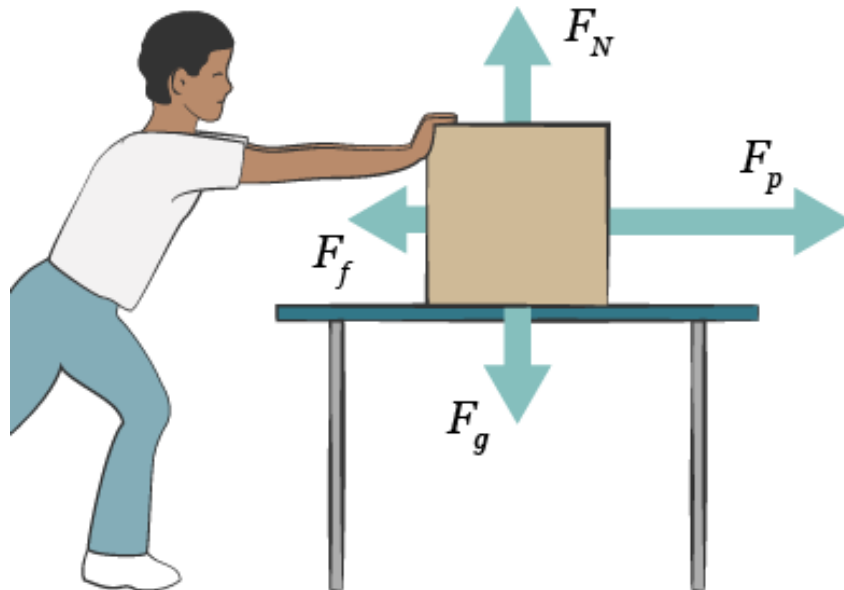
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Force Diagrams and Unbalanced Forces

- Force diagrams show when forces are balanced or .
- The length of the vector represents the of the force.
- The longer the vector is the force there is.
- The net force and the motion will be in the direction of the vector.

Circle the vector that represents the largest force.



Summary

Introduction to Forces

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Lesson
Question

How do forces affect the motion of an object?

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Answer

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Review: Key Concepts

FORCES

- A is a push or a pull.
- Forces are with magnitude and direction.
- Force diagrams show the type, magnitude, and of the forces acting on an object.
 - or pull, F_p
 - , F_g
 - , F_N
 - , F_f

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Review: Key Concepts**NET FORCE**

- The force is the sum of all forces acting on an object.
 - A net force of zero means that all forces are in and there is no change in motion.
 - A positive or negative net force causes a change in motion in the direction of the force.

Use this space to write any questions or thoughts about this lesson.