Name _____ Date _____ Class _____

Lesson Outline LESSON 2

Newton's First Law

A. Identifying Forces

1. To understand the motion of an object, you need to understand the _____ acting on it.

2. When two or more forces act on an object, the forces _____.

a. The combination of all the forces that act on an object is the _____.

b. When the forces applied to an object act in the same direction, the net force is the _____ of the individual forces.

c. Because forces have direction as well as strength, when you combine forces, you also have to specify a(n) _____.

d. When you combine forces in two opposite directions, one force is _____ and the other force is _____.

e. When the forces applied to an object act in exact opposite directions, the net force is the _____ of the individual positive and negative forces.

3. Forces that combine and form a net force of zero are _____.

a. Balanced forces have no effect on the _____ of an object.

b. Forces that combine and form a net force that is not zero are _____.

B. Newton's First Law of Motion

1. According to _____, if the net force on an object is zero, the motion of the object does not change.

2. When _____ forces act on an object, the object's velocity does not change.

3. If unbalanced forces act on an object at rest, the object will start _____.

4. If unbalanced forces act on a moving object, the object will change its _____.

Lesson Outline continued

5. The tendency of an object to resist a change in its motion is called _____.

C. Why do objects stop moving?

1. A book sitting on a table stays in place because of _____.
2. If you want to make the book move, you have to push the book hard enough to overcome the _____ between the book and the table.
3. On Earth, _____ can be reduced, but it never goes away completely.
4. On Earth, to keep an object in motion, a(n) _____ that balances friction must be applied continuously to it.

Name _____ Date _____ Class _____

Content Practice A LESSON 2

Newton's First Law

Directions: *On each line, write the term from the word bank that correctly completes each sentence. Some terms may be used more than once.*

balanced	**constant**	**direction**	**inertia**	**motionless**
net force	**reference direction**	**straight**	**unbalanced**	**velocity**

1. The combination of all forces acting on an object is the _____.

2. Because forces have a(n) _____, a(n) _____ must be specified when forces are combined.

3. Forces that combine to produce a(n) _____ of zero are _____; for a nonzero quantity, they are _____.

4. Newton's first law of motion states that if zero force is acting on an object at rest, the object will continue to be _____.

5. The same law states that a moving object subjected to zero force will continue in a(n) _____ line at a(n) _____ speed.

6. A(n) _____ set of forces cause a moving object to change its _____.

7. The tendency of an object to resist a change in its motion is called _____.

Name _____ Date _____ Class _____

Key Concept Builder LESSON 2

Newton's First Law

Key Concept How is motion related to balanced and unbalanced forces?

Balanced forces produce a lack of motion or a steady velocity. Unbalanced forces put a stationary object into motion (produce an acceleration) or change the velocity of a moving object.

Directions: *On the line before each item, write* B *if it represents balanced forces or* U *if it represents unbalanced forces.*

_____ **1.** a book lying on a table

_____ **2.** an airplane cruising in level flight

_____ **3.** a rock falling from a cliff

_____ **4.** a bridge collapsing in an earthquake

_____ **5.** a train rounding a curve at a steady speed

_____ **6.** a man sitting on a park bench

_____ **7.** the space shuttle taking off

_____ **8.** a satellite in orbit

_____ **9.** a car maintaining a constant speed on a straight road

_____ **10.** an airplane landing