Critical Thinking Items

9.1 Work, Power, and the Work–Energy Theorem 9.

Which activity requires a person to exert force on an object that causes the object to move but does not change the kinetic or potential energy of the object?

a. Moving an object to a greater height with acceleration
b. Moving an object to a greater height without acceleration
c. Carrying an object with acceleration at the same height
d. Carrying an object without acceleration at the same height

10.

Which statement explains how it is possible to carry books to school without changing the kinetic or potential energy of the books or doing any work?

a. By moving the book without acceleration and keeping the height of the book constant
b. By moving the book with acceleration and keeping the height of the book constant
c. By moving the book without acceleration and changing the height of the book
d. By moving the book with acceleration and changing the height of the book

9.2 Mechanical Energy and Conservation of Energy 11.

True or false—A cyclist coasts down one hill and up another hill until she comes to a stop. The point at which the bicycle stops is lower than the point at which it started coasting because part of the original potential energy has been converted to a quantity of heat and this makes the tires of the bicycle warm.

a. True
b. False

9.3 Simple Machines 12.

We think of levers being used to decrease effort force. Which of the following describes a lever that requires a large effort force which causes a smaller force to act over a large distance and explains how it works?

a. Anything that is swung by a handle, such as a hammer or racket. Force is applied near the fulcrum over a short distance, which makes the other end move rapidly over a long distance.
b. Anything that is swung by a handle, such as a hammer or racket. Force is applied far from the fulcrum over a large distance, which makes the other end move rapidly over a long distance.
c. A lever used to lift a heavy stone. Force is applied near the fulcrum over a short distance, which makes the other end lift a heavy object easily.

d. A lever used to lift a heavy stone. Force is applied far from the fulcrum over a large distance, which makes the other end lift a heavy object easily

13.

A baseball bat is a lever. Which of the following explains how a baseball bat differs from a lever like a pry bar?

a. In a baseball bat, effort force is smaller and is applied over a large distance, while the resistance force is smaller and is applied over a long distance.
b. In a baseball bat, effort force is smaller and is applied over a large distance, while the resistance force is smaller and is applied over a short distance.
c. In a baseball bat, effort force is larger and is applied over a short distance, while the resistance force is smaller and is applied over a long distance.
d. In a baseball bat, effort force is larger and is applied over a short distance, while the resistance force is smaller and is applied over a short distance.