

**Lesson Outline****LESSON 1****Work and Power****A. What is work?**

1. \_\_\_\_\_ is the transfer of energy that to an object by a force that makes an object move in the direction of the force.
2. A weightlifter does work when exerting a force that makes weights \_\_\_\_\_, but does no work to hold weights in place because the weights are not \_\_\_\_\_.

**B. Calculating Work**

1. You must know two things to calculate work—\_\_\_\_\_ and \_\_\_\_\_.
  - a. The force must be in \_\_\_\_\_.
  - b. The distance must be in \_\_\_\_\_.
2. A newton-meter is also called a(n) \_\_\_\_\_, which is the unit of work.
3. The work equation uses the distance that the \_\_\_\_\_ acts on the object, not necessarily the total \_\_\_\_\_ that the object moves.
4. The work done on an object depends on the \_\_\_\_\_ of the force applied and the direction of the motion.
  - a. When the force on an object and the motion of the object are in the same direction, you multiply the total \_\_\_\_\_ times the total distance to determine the amount of work done.
  - b. When the force on an object is at a(n) \_\_\_\_\_ to the direction of motion of the object, you multiply only the part of the force that is in the \_\_\_\_\_ of motion times the total distance to determine the amount of work done.
5. The weight of any object is due to the downward force of \_\_\_\_\_ on the object.
  - a. To lift an object, you must pull upward on the object with a force \_\_\_\_\_ to the object's weight.
  - b. The work done to lift any object is equal to the \_\_\_\_\_ of the object multiplied by the distance the object is lifted.

## Lesson Outline continued

### C. Work and Energy

1. Doing work on an object increases transfers \_\_\_\_\_ to the object.
2. Because doing work on an object requires that the object move, doing work on the object increases its \_\_\_\_\_ energy.
3. Lifting an object increases the object's gravitational \_\_\_\_\_ energy.

### D. What is power?

1. \_\_\_\_\_ is the rate at which work is done.
2. Power is determined by dividing the work done by the amount of \_\_\_\_\_ needed to do the work.
  - a. In the power equation, \_\_\_\_\_ done is in joules.
  - b. In the power equation, \_\_\_\_\_ is in seconds.
  - c. In the power equation, power is in \_\_\_\_\_.