*Name*_____
*Number*_____
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Guided Reading Chapter 7: Work and Machines

Section 7-1: What Is Work?

1. In scientific terms, when do you do work?

2. In order for you to do work on an object, the object must move some _____ as a result of your force.

3. Explain why you don't do any work when you carry an object at a constant velocity.

4. When you pull a sled through the snow, why does only part of your force do work?

5. The amount of work you do depends on both the amount of _____ you exert and the _____ the object moves.

6. Is the following sentence true or false? Lifting a heavier object demand greater force than lifting a lighter object.

7. Is the following sentence true or false? Moving an object a shorter distance requires more work than moving an object a greater distance.

8. What formula do you use to determine the amount of work done on an object?

9. What is the SI unit of work?

10. What is the amount of work you do when you exert a force of 1 Newton to move and object a distance of 1 meter?

Section 7-2: Mechanical Advantage and Efficiency

1. What is a machine?

2. Is the following sentence true or false? A machine decreases the amount of work needed to do a job.

3. Circle the letter of the sentences that are true about how a machine makes work easier.
   - **a.** A machine makes work easier by multiplying the force you exert.
   - **b.** A machine makes work easier by reducing the amount of force needed to do the job.
   - **c.** A machine makes work easier by multiplying the distance over which you exert force.
   - **d.** A machine makes work easier by changing the direction in which you exert force.

4. The force you exert on a machine is called the _____.

5. The force exerted by the machine is called the _____.

6. Is the following sentence true or false? In some machines, the output force is greater than the input force.

7. If a machine allows you to use less force to do some amount of work, then you must apply the input force over a greater _____.

8. Is the following sentence true or false? In some machines, the output force is less than the input force.

9. What is a machine's mechanical advantage?

10. What is the formula you use to determine the mechanical advantage of a machine?

11. In a machine that has a mechanical advantage of more than 1, the _____ force is greater than the _____ force.

12. In any machine, some work is wasted overcoming _____.

13. The comparison of a machine's output work to its input work is _____.

14. What is the formula you use to calculate the efficiency of a machine?

15. The mechanical advantage that a machine provides in a real situation is called the _____ mechanical advantage.

16. The mechanical advantage of a machine without friction is called the machine's _____ mechanical advantage.

Section 7-3: Simple Machines

1. What are the six basic kinds of simple machines?

2. What is an inclined plane?

3. What formula do you use to determine the ideal mechanical advantage of an inclined plane?

4. Circle the letter of each sentence that is true about inclined planes.
   a. The necessary input force is less than the output force.
   b. A ramp is an example of an inclined plane.
   c. The necessary input force is more than the output force.
   d. An inclined plane allows you to exert your force over a longer distance.

5. You can increase the _____ of an inclined plane by decreasing the friction.

6. What is a wedge?

7. Is the following sentence true or false? In a wedge, the inclined plane itself moves.

8. Is the following sentence true or false? A wedge multiplies force to do the job.

9. What is a screw?

10. A spiral inclined plane forms the _____ of a screw.

11. When using a screwdriver to twist a screw into a piece of wood, where is the input force applied and where is the output force exerted?

12. What is a lever?

13. The fixed point that a lever pivots around is called the _____.

14. Circle the letter of each sentence that is true about levers.
    a. A lever increases the effect of your input force.
    b. There are three different types of levers.
    c. A lever changes the direction of your input force.
    d. The fulcrum is always located at the same place on a lever.

15. What formula do you use to calculate the ideal mechanical advantage of a lever?

16. What is a wheel and axle?

17. What formula do you use to calculate the ideal mechanical advantage of a wheel and axle?

18. What is a pulley?

19. What kind of pulley changes the direction of the input force but does not change the amount of force you apply?

20. What kind of pulley has an ideal mechanical advantage of 2?

21. What is a compound machine?

22. What do you need to know to calculate the mechanical advantage of a compound machine?

23. A system of _____ is a device with toothed wheels that fit into one another.

Section 7-4: Machines in the Human Body

1. What do most of the levers in your body consist of?

2. Your muscles are attached to your bones by tough connective tissue called _____.

3. In a living lever in your body, what acts as the lever's fulcrum?

4. What simple machines do your incisors resemble?

5. Explain how your front teeth are like an ax.