4.3 Mechanical Advantage

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Across

5. The amount by which a machine can multiply an input force is called _____ _____.
6. Sometimes the IMA is less than 1 and the output distance is greater than the input distance. This usually means that the _____ at the output is higher than at the input.
8. The force applied to a machine is called the _____ force.
11. Some machines change the direction of the force you apply. A _____ used at the top of a flagpole is one example.
13. Most people would not be able to provide enough force to climb a rope to the next level in a building. _____ therefore are a machine that allows people to do the work more easily.
16. The mechanical advantage of a machine that has no friction is called its _____ _____ _____.
17. An exciting development in artificial limb technology is _____ which means that electric signals from a person's muscles can move an artificial limb.

Down

1. In the case of a car _____ the input force is the person pushing on the handle.
2. A _____ is a mechanical system that reduces the force required to accomplish work.
3. Since mechanical advantage is the _____ of two forces measured in newtons, mechanical advantage has no scientific units.
4. When you use a _____ to lift a cart onto a truck the distance that the cart is moved increases and thus the force applied decreases.
7. The force applied by a machine is called the _____ force.
9. Regardless of the technology used, an artificial limb is a machine that _____ forces.
10. Machines such as a nutcracker, ramp and car jack make work easier because the output force is _____ than the input force.
12. Machines that have a mechanical advantage of 1 only change the _____ between the input and the output forces.
14. An _____ machine has no friction and therefore no energy is converted to thermal energy.
15. The mechanical advantage of a bicycle can be calculated by measuring the force on the pedals and the force on the _____.