

Machines & Efficiency

1. Can a machine multiply input force? Input distance? Input energy? Explain.
2. You input a force of 100 N on a lever while moving it 2 meters. If the output force of the lever is 250 meters, with how much **force** is it outputting?
3. A force of 50 N is applied to the end of a lever which is moved a certain distance by the force. If the other end of the lever moves half as far, how much force can it exert?
4. Which is more **efficient**, machine 1 that has input energy of 200 J and output of 185 J, or machine 2 that has input energy of 500 J and output of 400 J?
5. Compared to work input, how much **work** is put out by a machine that operates at 30% efficiency?
6. Which has more **mechanical advantage**: machine 1 that has an input force of 300 N and an output force of 1100 N, or machine 2 that has an input force of 250 N and an output force of 1050 N?
7. Is a machine physically possible that has an efficiency of greater than 100%? Explain.
8. If something is less efficient, what does that mean physically?
9. How does the Law of Conservation of Energy apply to machines? Explain.
10. Give as many examples as you can of simple machines at work. Try to think of one example of each type.