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What is the formula of work energy and power

Any force which conserves mechanical energy, as opposed to a nonconservative force. See statement of conservation of mechanical energy. A system in which energy is conserved. The ability to do work. The energy of motion. Any force which does not conserve mechanical energy, as opposed to a conservative force. Property of conservative forces which states that the work done on any path between two given points is the same. The energy of configuration of a conservative system. For formulae, see Definition of potential energy, gravitational potential energy, and Definition of potential energy given a position-dependent force. The sum of the kinetic and potential energy of a conservative system. See definition of total mechanical energy. A force applied over a distance. For formulas, see work done by a constant force parallel to displacement and work done by any constant force, and work done by a position-dependent force. The units of work, equivalent to a Newton-meter. Also units of energy. Work done per unit time. For formulas, see Formula for average power, Definition of instantaneous power, and formula for instantaneous power. Unit of power; equal to joule/second. Work done by a constant force parallel to displacement W = Fx Work done by any constant force W = Fx cosθ Work-Energy Theorem W = ΔK Formula for average power = Definition of instantaneous power P = Formula for instantaneous power P = Fv cosθ Work done by a position-dependent force W = F(x)dx force. Definition of potential energy. ΔU = - W Gravitational potential energy. UG = mgh Statement of conservation of mechanical energy. Δ(U+K) = 0 Definition of total mechanical energy. U + K = E Definition of potential energy given a position-dependent force. ΔU = - F(x)dx Wind energy can provide power for some homes, though its effectiveness is dependent on several factors, according to Mother Earth News. You may need to combine wind turbines with another renewable energy source (such as solar panels) to power your home completely. Here are some other factors to consider.The Size or Location of Your PropertyIf you have a small piece of land, wind turbines may not be the ideal form of renewable energy for your home, states Mother Earth News. Rural areas are ideal for using wind power, but sometimes the neighbors and homeowner’s associations in urban areas can create conflict regarding the presence of a wind turbine. People may complain about the noise generated by the spinning turbine, or its appearance. If you live within city limits, it’s also a good idea to check on required permits before proceeding with your plan to power your house with wind power.The Presence of Wind BreaksThe presence of wind breaks can affect the way a turbine performs, as the wind can reach a higher average speed in open spaces. Buildings and trees create wind breaks that slow the flow of air currents through an area, which reduces the amount of energy a wind turbine is able to generate.Find the Best Location for the Wind TurbinesExplore your property to find the spot that consistently gets the most wind. Look for open spaces away from buildings and trees. Make sure there’s enough space around the turbine to secure it to the ground, and enough room above it that you have space to raise and lower it when you need to perform routine wind turbine maintenance.Match Your Energy Needs to Your System’s Average Annual OutputThis step takes a bit of math, so grab your pencil and paper or a calculator. The small wind turbines used for homes usually generate between 400 watts and 20 kilowatts. The average home uses about 10,932 kilowatt-hours each year. At this usage rate, you would need a wind turbine that generates between 5 and 15 kilowatts per day, according to Energy.gov. The height your turbine is mounted at affects its output, with highly elevated turbines delivering more power.Decide If You Want to Connect to the Electric GridThere are advantages and disadvantages of connecting your wind electric system to the grid. When the turbine doesn’t produce enough energy to run your home, the grid delivers the power you need to keep your home functioning. You also have the opportunity to sell the excess power your turbine generates to the power company, according to Energy.gov. If the power is out in the grid, however, your turbine won’t be permitted to run because it would create a safety hazard. Each utility company generates its own list of things you have to do if you want to connect to the grid. MORE FROM QUESTIONSANSWERED.NET "Power is a subject that makes many people extremely uncomfortable," Stanford professor Jeffrey Pfeffer argues, but just because we don't like to think about power doesn't mean it's not the lifeblood of business. "Power is in fact all around...like air and water and gravity," he insists in a recent short video for Insights by Stanford Business.Ignoring power, therefore, won't make it disappear any more than wishing away gravity will help you fly. Instead of sticking your head in the sand, Pfeffer suggests you get real and start thinking constructively about accumulating power. How can you do that? In the video he offers a handful of actionable (if not necessarily universally palatable) tips.You can't gather more power to yourself if you don't know who is currently in possession of it, Pfeffer points out. Therefore, the first step to increasing your own power is to take a look around and find out who really holds the reins. It might not be whom you first suspect (or who the org chart indicates). "Often times, it's an assistant or a secretary or people who aren't necessarily that high up in the organization chart," he says.Once you know who has the power, it's your job to get close to those people and make sure they support your aims. That might sound Machiavellian, but Pfeffer insists that cultivating power in this way is both practical and essential, and he offers commonsense approaches to cozy up to the powerful, such as making sure you put your skills on show in a way that's visible to them. For instance, he recommends "doing small tasks that make those individuals' lives easier."Power is as much about who likes you as what you can do, so if you're looking to cultivate power, you can't get away from networking. Make sure you spend time with the individuals who you identified as powerful so you can build closer personal relationships with them. It might make you feel grubby, but there are ways to network that are authentic and honest.Pfeffer's next tip won't sit well with everyone, but like it or not, it's effective, he insists. What's this controversial trick? Simple flattery. "People like to think good about themselves, and we all love people who make us think good about ourselves," he says.Not really comfortable with brown-nosing? Then how about this idea: Search out underutilized resources around you and figure out how to exploit them to their full capacity. Pfeffer gives the example of an organization that has a fund for training or events. Those looking to gain power could try to get ahold of some of that cash to bring people they would like to network with to speak at the company. Or be the one to organize a dinner or other team-building occasion for your colleagues. The aim is "to put yourself at the center of a series of relationships," Pfeffer explains.What advice would you add to this list? Let us know in the comments. Work Work has a specific definition in physics. Work is done when a force is exerted on an object, and the object moves from one place to another. Work is the result of a force, acting over a certain distance. This distance is called the displacement of the object. If the force F, and the displacement d, are in the same direction, then the work W is given by the formula, W = Fd The work is the product of the force and the displacement. In SI (international system) units, the unit of force is the Newton (N), and the unit of distance or displacement is the meter (m). Therefore, the unit of work can be expressed as a Newton-meter, N•m. This is also known as a Joule, J. The Newton is a compound unit, and so a Joule is also equal to, The equation W = Fd depends on the force and the displacement being in the same direction. There are many situations in which their directions are different, for example, a person pushing on a box close to the ground. A component of the force the person applies is directed down, even though the resulting direction of the box is forward. In a case like this, only the component of the force that is along the path of the box's displacement contributes to the work done. If we treat the force and the displacement as vectors, the work can be found by using the dot product (also known as the scalar product). The work is equal to, In this formula, θ is the angle between the force and displacement vectors, and F and d are the magnitudes of the vectors. Energy The kinetic energy (K) of an object is equal to the amount of work that is required to accelerate the object from rest to a certain velocity, v. This relationship between kinetic energy and work is called the work-energy theorem. The kinetic energy of an object is a scalar value, meaning it does not depend on the direction the object moves in. The value of kinetic energy is always positive or zero. The unit of kinetic energy is the same as the unit of work, the Joule (J). The kinetic energy of an object can be related to its mass and velocity with the formula, This formula for kinetic energy can be found from the equation for work, if the force is in the same direction as the object's displacement. This formula depends on the kinematic formula, The change in position, (x - x0), is equal to the displacement magnitude, d. The formula can be rearranged to isolate for the acceleration, a, Force is equal to the mass of an object multiplied by its acceleration, so the force is, F = ma This formula for force can be substituted in to the formula for work, W = Fd Therefore, the work done by the force on an object is equal to the change in the object's kinetic energy, W = K2 - K1 W = ΔK In this formula, the Greek uppercase letter Δ ("delta") is used to mean "the change in". Work can be used to understand the energy of many objects that experience forces. One example is the work required to stretch a spring. If the magnitude of the displacement of the object is labeled x, and this represents the displacement away from an equilibrium position x = 0, then the force required to pull the object on the spring to a position x is, F = kx The constant k in this equation is the spring constant, which is different for every spring. The spring constant has units Newtons per meter, N/m. The work required to pull the spring from any starting position x1 to a final position x2 is, Power Power is a rate of doing work. It is a measure of how quickly work is done. For a quantity of work W that is done in an amount of time t, the power done is, The unit for power is the Watt (W), which is equal to a Joule per second, 1 W=1 J/s Power can also be expressed in as force F times velocity v. Since work is given by force times distance, W = Fd, and velocity is distance divided by time, v = d/t, then power is,

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