

## main points

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- The Law of Conservation of Energy tells us that energy is never created or destroyed. It is only transformed between different forms and transferred from place to place.
- Energy is formally defined as “the capacity to do work.”
- Potential energy is energy embodied in the *positional arrangement* of things.
- Kinetic energy is the energy of movement.
- Energy exchange is a part of all chemical reactions.
- An initial input of energy is required to initiate all chemical reactions. We call this the activation energy of a reaction.
- Reactions that release energy overall are known as exothermic reactions, while reactions that absorb energy overall are known as endothermic reactions.
- Chemical (and physical) processes occur spontaneously in the direction that leads to an increase in the entropy (“disorder”) of the universe. This can be brought about by the net dispersal of energy and/or matter.
- A process that would be nonspontaneous on its own can be driven forward by being coupled to a spontaneous process, so that the combination of the two processes becomes spontaneous.
- The main factors influencing reaction rates are temperature, concentration, and the presence of catalysts.
- Learning about energy helps us to understand many of the choices faced in everyday life and helps us to make the choices most appropriate to our circumstances.