

Bad effects of computer addiction

[Science](#), [Chemistry](#)



An ecosystem comprises all living organisms, known as biotic factors, into a defined area complemented by the physical environment known as the abiotic factors. The ecosystem constitutes plants, animals, micro-organisms, soil, rock, minerals, water sources, and the local atmosphere interacting with one another.

Fact 1. Within an ecosystem, there is a continuous succession of plants, bacteria, and animals until equilibrium is reached.

Fact 2. Humans have transformed the global environment on a huge scale since the last century, especially since the industrial age. Pollution, such as acid rain, has altered the ecosystem tremendously.

Fact 3. Ecosystems provide a great, worldwide diversity to humans who have made maximum usage of the ecosystem. Research is being conducted in determining the tolerable level of ecosystems towards an equilibrium between domestic usage and continued sustainability.

Fact 4. Scientists from Microsoft Research and the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) are developing the world's first computer model of the global ecosystem. This model will improve understanding of the biosphere and assist in biodiversity and conservation policies.

Fact 5. The model known as GEM, or General Ecosystem Models, is capable of simulating ecosystem processes including feeding, reproduction, and death.

Fact 6. GEMS can be applied to any climatic framework including African savannas. GEMS will be able to model the total biomass of all plants, grazing

animals and carnivores, as well as mapping the flows of energy and nutrients within the food chain over a specific time.

Fact 7. The Commission on Ecosystem Management (CEM) is one of the IUCN's scientific commissions. CEM is a global network of volunteer experts working on ecosystem management-related issues such as climate change adaptation and disaster risk reduction.

Fact 8. The IUCN was initiated in 1948 and has been engaging the private sector in conserving the integrity and diversity of nature and ensuring the equitable usage of natural resources.

Fact 9. In terms of the near extinction of animals, such as the pygmy three-toed sloth that exists only on Escudo Island near Panama, it is the smallest and slowest sloth in the world and remains critically endangered.

Fact 10. Another animal which is critically endangered is the saola, known as the Asian unicorn due to its rarity. The saola is the most-threatened mammal in Southeast Asia.

What are the different forms of energy? Energy has a number of different forms, all of which measure the ability of an object or system to do work on another object or system. In other words, there are different ways that an object or a system can possess energy. Here are the different basic forms:

Kinetic Energy: Consider a baseball flying through the air. The ball is said to have "kinetic energy" by virtue of the fact that it is in motion relative to the ground. You can see that it has energy because it can do "work" on an object on the ground if it collides with it (either by pushing on it and/or damaging it during the collision). The formula for Kinetic energy, and for

some of the other forms of energy described in this section will, is given in a later section of this primer.

Potential Energy:

Consider a book sitting on a table. The book is said to have "potential energy" because if it is nudged off, gravity will accelerate the book, giving the book kinetic energy. Because the Earth's gravity is necessary to create this kinetic energy, and because this gravity depends on the Earth being present, we say that the "Earth-book system" is what really possesses this potential energy, and that this energy is converted into kinetic energy as the book falls.

Thermal, or heat energy:

Consider a hot cup of coffee. The coffee is said to possess "thermal energy", or "heat energy" which is really the collective, microscopic, kinetic and potential energy of the molecules in the coffee (the molecules have kinetic energy because they are moving and vibrating, and they have potential energy due their mutual attraction for one another - much the same way that the book and the Earth have potential energy because they attract each other). Temperature is really a measure of how much thermal energy something has. The higher the temperature, the faster the molecules are moving around and/or vibrating, i. e. the more kinetic and potential energy the molecules have.

Chemical Energy:

Consider the ability of your body to do work. The glucose (blood sugar) in your body is said to have "chemical energy" because the glucose releases

energy when chemically reacted (combusted) with oxygen. Your muscles use this energy to generate mechanical force and also heat. Chemical energy is really a form of microscopic potential energy, which exists because of the electric and magnetic forces of attraction exerted between the different parts of each molecule - the same attractive forces involved in thermal vibrations. These parts get rearranged in chemical reactions, releasing or adding to this potential energy.

Electrical Energy

All matter is made up of atoms, and atoms are made up of smaller particles, called protons (which have positive charge), neutrons (which have neutral charge), and electrons (which are negatively charged). Electrons orbit around the center, or nucleus, of atoms, just like the moon orbits the earth. The nucleus is made up of neutrons and protons. Some material, particularly metals, have certain electrons that are only loosely attached to their atoms. They can easily be made to move from one atom to another if an electric field is applied to them. When those electrons move among the atoms of matter, a current of electricity is created. This is what happens in a piece of wire when an electric field, or voltage, is applied. The electrons pass from atom to atom, pushed by the electric field and by each other (they repel each other because like charges repel), thus creating the electrical current.

The measure of how well something conducts electricity is called its conductivity, and the reciprocal of conductivity is called the resistance. Copper is used for many wires because it has a lower resistance than many other metals and is easy to use and obtain. Most of the wires in your house are made of copper. Some older homes still use aluminum wiring. The

energy is really transferred by the chain of repulsive interactions between the electrons down the wire - not by the transfer of electrons per se. This is just like the way that water molecules can push on each other and transmit pressure (or force) through a pipe carrying water. At points where a strong resistance is encountered, it's harder for the electrons to flow - this creates a "back pressure" in a sense back to the source. This back pressure is what really transmits the energy from whatever is pushing the electrons through the wire.

Of course, this applied "pressure" is the "voltage". As the electrons move through a "resistor" in the circuit, they interact with the atoms in the resistor very strongly, causing the resistor to heat up - hence delivering energy in the form of heat. Or, if the electrons are moving instead through the wound coils of a motor, they instead create a magnetic field, which interacts with other magnets in the motor, and hence turns the motor. In this case the "back pressure" on the electrons, which is necessary for there to be a transfer of energy from the applied voltage to the motor's shaft, is created by the magnetic fields of the other magnets (back) acting on the electrons - a perfect push-pull arrangement!

Electrochemical Energy:

Consider the energy stored in a battery. Like the example above involving blood sugar, the battery also stores energy in a chemical way. But electricity is also involved, so we say that the battery stores energy "electro-chemically". Another electron chemical device is a "fuel-cell".

Electromagnetic Energy (light):

Consider the energy transmitted to the Earth from the Sun by light (or by any source of light). Light, which is also called "electro-magnetic radiation". Why the fancy term? Because light really can be thought of as oscillating, coupled electric and magnetic fields that travel freely through space (without there having to be charged particles of some kind around). It turns out that light may also be thought of as little packets of energy called photons (that is, as particles, instead of waves). The word "photon" derives from the word "photo", which means "light". Photons are created when electrons jump to lower energy levels in atoms, and absorbed when electrons jump to higher levels. Photons are also created when a charged particle, such as an electron or proton, is accelerated, as for example happens in a radio transmitter antenna.

But because light can also be described as waves, in addition to being a packet of energy, each photon also has a specific frequency and wavelength associated with it, which depends on how much energy the photon has (because of this weird duality - waves and particles at the same time - people sometimes call particles like photons "wavicles"). The lower the energy, the longer the wavelength and lower the frequency, and vice versa. The reason that sunlight can hurt your skin or your eyes is because it contains "ultraviolet light", which consists of high energy photons.

These photons have short wavelength and high frequency, and pack enough energy in each photon to cause physical damage to your skin if they get past the outer layer of skin or the lens in your eye. Radio waves, and the radiant heat you feel at a distance from a campfire, for example, are also forms of electro-magnetic radiation, or light, except that they consist of low energy

photons (long wavelength and high frequencies - in the infrared band and lower) that your eyes can't perceive. This was a great discovery of the nineteenth century - that radio waves, x-rays, and gamma-rays, are just forms of light, and that light is electro-magnetic waves.

Sound Energy:

Sound waves are compression waves associated with the potential and kinetic energy of air molecules. When an object moves quickly, for example the head of drum, it compresses the air nearby, giving that air potential energy. That air then expands, transforming the potential energy into kinetic energy (moving air). The moving air then pushes on and compresses other air, and so on down the chain. A nice way to think of sound waves is as "shimmering air".

Nuclear Energy:

The Sun, nuclear reactors, and the interior of the Earth, all have " nuclear reactions" as the source of their energy, that is, reactions that involve changes in the structure of the nuclei of atoms. In the Sun, hydrogen nuclei fuse (combine) together to make helium nuclei, in a process called fusion, which releases energy. In a nuclear reactor, or in the interior of the Earth, Uranium nuclei (and certain other heavy elements in the Earth's interior) split apart, in a process called fission. If this didn't happen, the Earth's interior would have long gone cold! The energy released by fission and fusion is not just a product of the potential energy released by rearranging the nuclei. In fact, in both cases, fusion or fission, some of the matter making up the nuclei is actually converted into energy. How can this be? The answer

is that matter itself is a form of energy! This concept involves one of the most famous formula's in physics, the formula, $E= mc^2$.

This formula was discovered by Einstein as part of his " Theory of Special Relativity". In simple words, this formula means: The energy intrinsically stored in a piece of matter at rest equals its mass times the speed of light squared. When we plug numbers in this equation, we find that there is actually an incredibly huge amount of energy stored in even little pieces of matter (the speed of light squared is a very very large number!). For example, it would cost more than a million dollars to buy the energy stored intrinsically stored in a single penny at our current (relatively cheap!) electricity rates. To get some feeling for how much energy is really there, consider that nuclear weapons only release a small fraction of the " intrinsic" energy of their components.

Laws of Thermodynamics

© Eric R. Pianka Let us briefly review some fundamentals of thermodynamics. All organisms require energy to persist and to replace themselves, and the ultimate source of practically all Earth's energy is the Sun. One can think of our Sun as " feeding" the earth via its radiant energy. But 99 percent or more of this incident solar radiation goes unused by organisms and is lost as heat and heat of evaporation; only about 1 percent is actually captured by plants in photosynthesis and stored as chemical energy. Moreover, energy available from sunlight varies widely over the earth's surface both in space and in time.

Physics and chemistry have produced two basic laws of thermodynamics that are obeyed by all forms of matter and energy, including living organisms.

The first law is that of " conservation of matter and energy," which states that matter and energy cannot be created or destroyed. Matter and energy can be transformed, and energy can be converted from one form into another, but the total of the equivalent amounts of both must always remain constant. Light can be changed into heat, kinetic energy, and/or potential energy. Whenever energy is converted from one form into another, some of it is given off as heat, which is the most random form of energy. Indeed, the only energy conversion that is 100 percent efficient is conversion to heat, or burning. Aliquots of dried organisms can be burned in " bomb calorimeters" to determine how much energy is stored in their tissues. Energy can be measured in a variety of different units such as ergs and joules, but heat energy or calories is the common denominator.

The second law of thermodynamics states that energy of all sorts, whether it be light, potential, chemical, kinetic, or whatever, tends to change itself spontaneously into a more dispersed, random, or less organized, form. This law is sometimes stated as " entropy increases" entropy being random, unavailable energy. Suppose you heat a skillet to cook an egg, and after finishing you leave it on the stove. At first, heat energy is concentrated near the skillet, which is, relative to the rest of the room, hot and quite nonrandom. But by the next morning the skillet has cooled to air temperature, and the heat energy has radiated throughout the room.

That heat energy is now dispersed and unavailable for cooking; the system of the skillet, the room, and the heat has gone toward equilibrium, become more random, and entropy has increased. Unless an outside source of energy such as a stove, with fuel or electricity, is continually at work to maintain a non-equilibrium state, dispersion of heat results in a random equilibrium state. The same is true for all kinds of energy. According to this law, our solar system and presumably the entire universe should theoretically become a completely random overdispersed array of molecules and heat in the far distant future.

Life has sometimes been called "reverse entropy" (negentropy) because organisms maintain complex organized non-random states compared to their surroundings. But they must obey the second law just as any other system of matter and energy; all organisms must work continually to build and maintain nonrandom assemblages of matter and energy locally.

This process requires energy, and organisms use the energy of the decaying sun (which, of course, also obeys the second law of thermodynamics and tends toward decreasing concentration of energy A Cosmic Perspective) to "oppose" the second law within their own tissues by concentrating energy in their own bodies. Wherever there is a live plant or animal, there must be an energy source. Without a continued influx of energy, no organism can survive for very long. Again, this "reverse entropy" occurs only within each organism, and the overall energy relations of the entire solar system are in accord with the second law of thermodynamics, with the overall system continually becoming more and more random.