**So, you think you’re science literate?**

**Here are 60 scientific concepts that anyone with a good knowledge of high-school science should recognize.**

1. **Read the definitions and try to figure out which scientific concept it describes.**
2. **Perhaps you even know the English terms for it.**
3. **If not, look for the appropriate term in the table.**

**You’ve got fewer than 30 right? Better brush up a bit. More than 50? Congratulations!**

**Absolute zero..**

lowest possible temperature, -273.15 degrees Celsius; the point at which all molecular and atomic motion ceases

**……………………………………..**

contains a high concentration of acidity, resulting from sulfur and nitrogen oxides emitted primarily from motor vehicles and power plants

**……………………………………..**

compounds containing nitrogen, oxygen, carbon and hydrogen which, when linked, are known as proteins

**……………………………………..**

naturally produced protein formed by the blood in response to an invading *antigen*, such as a bacterium. After such exposure, the body has *acquired immunity* to this particular pathogen.

**Antimatter..**

matter identical to the ordinary variety but with an opposite electric charge. A *positron* is the **positive** equivalent of an electron.

**……………………………………..**

study of the motion, size and other traits of heavenly bodies; distinct from *astrology*, a pseudoscience that believes planetary positions influence events on Earth

**atom..**

the smallest unit of matter that can take part in a chemical reaction; consists of a *nucleus*, which in turn is composed of one or more *protons* and *neutrons* orbited by one or more *electrons*

**atomic bomb..**

powered by the splitting of an atomic nucleus (*nuclear fission*); a *thermonuclear* or *hydrogen bomb* releases energy when atomic nuclei undergo *nuclear fusion*, or a combination

**……………………………………..**

microscopic organisms larger than viruses that replicate by splitting or forming spores and, unlike viruses, are vulnerable to antibiotics

**big bang theory..**

the leading idea in *cosmology*, the study of the origin and evolution of the universe, holds that the universe, holds that the universe began in an immense explosion of space-time. The legacy of that action is the *expanding universe*, in which everything races away from everything else like raisins in a rising tea cake.

**……………………………………..**

total weight of all organisms in a particular place, such as a swamp

**……………………………………..**

collapsed star with such a strong gravitational field that nothing, not even light, can escape it

**……………………………………..**

unit of 8 binary digits, used as a measure of computer storage capacity

**……………………………………..**

circulation of carbon from plants that take in *carbon dioxide* from the air and convert it into *carbohydrates* (any compound made of only carbon, hydrogen and oxygen) by *photosynthesis*, the process in which sunlight is changed into energy; animals eat the plants, respire and decay, returning gaseous carbon to the atmosphere

**……………………………………..**

the basic unit of life. Within cells, *DNA*, the molecule that encodes heredity, contains the blueprint for producing proteins, which fuel biochemical reactions and comprise the structural components of the organism.

**……………………………………..**

temperature scale, a.k.a. Celsius, in which water boils at 100 degrees C and freezes at zero

**……………………………………..**

part of the brain that controls muscles

**……………………………………..**

part of the brain that controls higher thought

**……………………………………..**

attractive force that links atoms into molecules

**……………………………………..**

fatty substance present in the body, as well as in all animal fats, blood, nervous tissue and bile; strongly linked to hardening of the arteries

**……………………………………..**

a string-like body, usually in a cell nucleus. Along it are strung *genes* that govern heredity.

**……………………………………..**

a ball of frozen gas and dust that follows a very stretched-out orbit around the Sun

**……………………………………..**

any material that transmits heat, light or other energy

**……………………………………..**

Francis and James, British and American biologists who discovered that *DNA* has the shape of a *double helix*

**Doppler Effect..**

the change in perceived frequency of waves when either the source or receiver moves. For instance, a siren moving toward you increases its pitch, then becomes lower as it speeds away.

**E=mc²..**

the relationship discovered by *Albert Einstein* between energy and mass and the speed of light, which determines how much energy a given amount of mass can be converted into. A consequence of Einstein’s *theory of special relativity*, it is the basis for the *atomic bomb*, in which splitting atoms releases energy equivalent to the mass lost.

**……………………………………..**

place and function of an organism in an *ecosystem*, such as living on the savanna and hunting gazelles

**electromagnetic radiation..**

any wave of energy generated when an electric charge, such as an electron, is accelerated. Includes light, radio waves and X-rays, which differ only in their frequency

**……………………………………..**

any indivisible unit of matter, such as an *electron or quark*

**……………………………………..**

the measure of a disorder of a system. According to the laws of thermodynamics, entropy always increases in a closed system unless energy is added.

**……………………………………..**

protein that causes or accelerates biochemical reactions in cells

**evolution..**

the central tenet of biology, as first articulated by Charles Darwin in *“The Origin of Species,”* stating that random *mutations*, or changes in genes, are naturally selected, i.e., passed on to the next generation, if they improve the organism’s *fitness* or abilityto survive and reproduce. The changes in an organism’s structure or behavior to fit new conditions are *adaptations*. Contrast with *creationism,* the idea that God formed all organisms in their current form.

**……………………………………..**

any …. derived from decayed organisms, such as oil, gas and coal

**……………………………………..**

the altering of *genes* through any technique of molecular biology, such as splicing foreign *DNA* into a host’s *chromosomes;* also called *recombinant DNA*

**……………………………………..**

all the genes in an organism. A multibillion-dollar project to determine the sequence of the human ……….. has been finished.

**……………………………………..**

a fissure in the earth, usually where *tectonic plates*, large masses of the earth’s crust, meet. Often the site of earthquakes

**……………………………………..**

deriving from the heat of the earth, as evidenced by thermal springs and geysers

**……………………………………..**

one of four basic forces of nature, which moves objects toward each other. A very weak force, it was shown by *Einstein* to be a consequence of the shape of space-time. In contrast, the other three basic forces of nature, the strong *nuclear force, the weak nuclear force* and *electromagnetism,* are carried by particles. A primary goal of physics is to unify the four forces into a *unified theory*.

**……………………………………..**

warming of a planet caused by an accumulation of gases that trap heat in the atmosphere

**……………………………………..**

the principle that certain qualities of an object, such as an electron, cannot be simultaneously known with perfect precision, because the act of measuring one quantity changes the other

**……………………………………..**

the species to which modern man belongs; arose about 200,000 years ago

**……………………………………..**

substance secreted by endocrine glands which affect an organ or tissue elsewhere in the body

**……………………………………..**

invisible part of the electromagnetic spectrum, with waves longer than light; heat from sunlight and lamps is ………….. radiation

**……………………………………..**

any electrically charged atom or molecule

**……………………………………..**

high-energy radiation that knocks out electrons of material which it passes through, such as human tissue, causing ions to form. The loose electrons can cause cancer.

**……………………………………..**

air current, moving west to east about 10 to 15 miles up, that affects weather

**……………………………………..**

Gregor, 1822 – 1884. Austrian monk and botanist who first discovered such principles of inheritance as *dominant* and *recessive traits*

**……………………………………..**

nerve cell, of which the human nervous system has some 10 billion

**……………………………………..**

a guiding principle of science, stating that the simplest hypothesis accounting for the most facts is likely to be correct

**……………………………………..**

containing carbon

**ozone layer..**

a layer of ……… gas (composed of three oxygen atoms) 6 to 12 miles above the Earth that screens out most harmful ultraviolet radiation. Currently being damaged by *chlorofluorocarbons (Freons)*, gases used as refrigerants and for other industrial applications

**……………………………………..**

a fourth state of matter (distinct from solids, liquids and gases), consisting of a gas of ions; believed to constitute 99 percent of the universe. Also, the clear, liquid, noncellular component of blood

**……………………………………..**

star-like objects at the edge of the universe. They provide clues to its age and origin.

**……………………………………..**

collects radio (as opposed to light) waves; used to search for extraterrestrial life

**……………………………………..**

an open-ended scale indicating the severity of earthquakes. 2.0 is barely felt; 6.0 causes considerable structural damage and anything above 8.0 causes massive destruction.

**……………………………………..**

identify the problem, gather pertinent (= applicable) data, form a working hypothesis (explanation), do experiments to test the hypothesis, interpret the result, draw a conclusion and modify hypothesis as needed

**……………………………………..**

characteristic carried on either the *X* or *Y chromosome*, such as colorblindness

**……………………………………..**

gaseous celestial body, such as the Sun, located in a *galaxy* (collection of these bodies under mutual gravitational attraction) like our Milky Way

**……………………………………..**

material that conducts energy without resistance

**……………………………………..**

recently discovered subatomic particle that carries the weak nuclear force, one of the four basic forces of nature

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| --- | --- | --- | --- | --- |
| **~~E = mc~~~~2~~** | **cell** | **antibody** | **organic** | **greenhouse effect** |
| **Z-particle** | **Mendel** | **evolution** | **sex-linked trait** | **astronomy** |
| **neuron** | **ecological niche** | **superconductor** | **enzyme** | **byte** |
| **~~antimatter~~** | **centigrade** | **~~absolute zero~~** | **comet** | **Occam’s razor** |
| **fossil fuel** | **ion** | **black hole** | **biomass** | **ionizing radiation** |
| **Richter scale** | **star** | **~~Doppler effect~~** | **acid rain** | **cerebral cortex** |
| **amino acids** | **entropy** | **infrared** | **hormone** | **atom** |
| **bacteria** | **plasma** | **gravity** | **radio telescope** | **~~ozone layer~~** |
| **genetic engineering** | **atomic bomb** | **conductor** | **big-bang theory** | **Crick and Watson** |
| **scientific method** | **elementary particle** | **genome** | **quasar** | **chromosome** |
| **carbon cycle** | **geological fault** | **cerebellum** | **Homo sapiens** | **chemical bond** |
| **cholesterol** | **geothermal energy** | **jet stream** | **Heisenberg uncertainty principle** | **electromagnetic radiation** |