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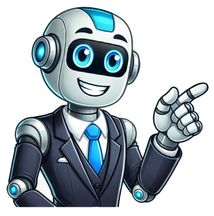

Health & Medicine Anatomy & Physiology Ask the Chatbot a Question human body, the physical substance of the human organism, composed of living cells and extracellular materials and organized into tissues, organs, and systems. Human anatomy and physiology are treated in many different articles. For detailed discussions of specific tissues, organs, and systems, see human blood; cardiovascular system; human digestive system; human endocrine system; renal system; skin; human muscle system; nervous system; human reproductive system; human respiration; human sensory reception; and human skeletal system. For a description of how the body develops, from conception through old age, see aging; human aging; growth; prenatal development; and human development. For detailed coverage of the bodys biochemical constituents, see protein; carbohydrate; lipid; nucleic acid; vitamin; and hormone. For information on the structure and function of the cells that constitute the body, see cell. Many entries describe the bodys major structures. For example, see abdominal cavity; adrenal gland; aorta; bone; brain; ear; eye; heart; kidney; large intestine; lung; nose; ovary; pancreas; pituitary gland; small intestine; spinal cord; spleen; stomach; testis; thymus; thyroid gland; tooth; uterus; and vertebral column. Humans are, of course, animalsmore particularly, members of the order Primates in the subphylum Vertebrata of the phylum Chordata. Like all chordates, the human animal has a bilaterally symmetrical body that is characterized at some point during its development by a dorsal supporting rod (the notochord), gill slits in the region of the pharynx, and a hollow dorsal nerve cord. Of these features, the first two are present only during the embryonic stage in the human; the notochord is replaced by the vertebral column, and the pharyngeal gill slits are lost completely. The dorsal nerve cord is the spinal cord in humans; it remains throughout life. Facts You Should Know: The Human Body Quiz Human muscular systemLateral view of the human muscular system.Characteristic of the vertebrate form, the human body has an internal skeleton that includes a backbone of vertebrae. Typical of mammalian structure, the human body shows such characteristics as hair, mammary glands, and highly developed sense organs. Beyond these similarities, however, lie some profound differences. Among the mammals, only humans have a predominantly two-legged (bipedal) posture, a fact that has greatly modified the general mammalian body plan. (Even the kangaroo, which hops on two legs when moving rapidly, walks on four legs and uses its tail as a third leg when standing.) Moreover, the human brain, particularly the neocortex, is far and away the most highly developed in the animal kingdom. As intelligent as are many other mammalssuch as chimpanzees and dolphinsnone have achieved the intellectual status of the human species. Chemically, the human body consists mainly of water and of organic compoundsi.e., lipids, proteins, carbohydrates, and nucleic acids. Water is found in the extracellular fluids of the body (the blood plasma, the lymph, and the interstitial fluid) and within the cells themselves. It serves as a solvent without which the chemistry of life could not take place. The human body is about 60 percent water by weight. Lipidschiefly fats, phospholipids, and steroidsare major structural components of the human body. Fats provide an energy reserve for the body, and fat pads also serve as insulation and shock absorbers. Phospholipids and the steroid compound cholesterol are major components of the membrane that surrounds each cell. Proteins also serve as a major structural component of the body. Like lipids, proteins are an important constituent of the cell membrane. In addition, such extracellular materials as hair and nails are composed of protein. So also is collagen, the fibrous, elastic material that makes up much of the bodys skin, bones, tendons, and ligaments. Proteins also perform numerous functional roles in the body. Particularly important are cellular proteins called enzymes, which catalyze the chemical reactions necessary for life. Carbohydrates are present in the human body largely as fuels, either as simple sugars circulating through the bloodstream or as glycogen, a storage compound found in the liver and the muscles. Small amounts of carbohydrates also occur in cell membranes, but, in contrast to plants and many invertebrate animals, humans have little structural carbohydrate in their bodies. Nucleic acids make up the genetic materials of the body. Deoxyribonucleic acid (DNA) carries the bodys hereditary master code, the instructions according to which each cell operates. It is DNA, passed from parents to offspring, that dictates the inherited characteristics of each individual human. Ribonucleic acid (RNA), of which there are several types, helps carry out the instructions encoded in the DNA. Along with water and organic compounds, the bodys constituents include various inorganic minerals. Chief among these are calcium, phosphorus, sodium, magnesium, and iron. Calcium and phosphorus, combined as calcium-phosphate crystals, form a large part of the bodys bones. Calcium is also present as ions in the blood and interstitial fluid, as is sodium. Ions of phosphorus, potassium, and magnesium, on the other hand, are abundant within the intercellular fluid. All of these ions play vital roles in the bodys metabolic processes. Iron is present mainly as part of hemoglobin, the oxygen-carrying pigment of the red blood cells. Other mineral constituents of the body, found in minute but necessary concentrations, include cobalt, copper, iodine, manganese, and zinc. The organization of multicelluar tissues and organsThe diagram shows five levels of organization in a multicellular organism. The most basic unit is the cell; groups of similar cells form tissues; groups of different tissues make up organs; groups of organs form organ systems; cells, tissues, organs, and organ systems combine to form a multicellular organism.The cell is the basic living unit of the human bodyindeed, of all organisms. The human body consists of trillions of cells, each capable of growth, metabolism, response to stimuli, and, with some exceptions, reproduction. Although there are some 200 different types of cells in the body, these can be grouped into four basic classes. These four basic cell types, together with their extracellular materials, form the fundamental tissues of the human body: epithelial tissues, which cover the bodys surface and line the internal organs, body cavities, and passagewaysmuscle tissues, which are capable of contraction and form the bodys musculaturenerve tissues, which conduct electrical impulses and make up the nervous systemconnective tissues, which are composed of widely spaced cells and large amounts of intercellular matrix and which bind together various body structures Bone and blood are considered specialized connective tissues, in which the intercellular matrix is, respectively, hard and liquid. How are different systems of the human body connected?A discussion of the organ systems of the human body and their influence on one another.See all videos for this articleThe next level of organization in the body is that of the organ. An organ is a group of tissues that constitutes a distinct structural and functional unit. Thus, the heart is an organ composed of all four tissues, whose function is to pump blood throughout the body. Of course, the heart does not function in isolation; it is part of a system composed of blood and blood vessels as well. The highest level of body organization, then, is that of the organ system. The body includes nine major organ systems, each composed of various organs and tissues that work together as a functional unit. The chief constituents and prime functions of each system are: The integumentary system, composed of the skin and associated structures, protects the body from invasion by harmful microorganisms and chemicals; it also prevents water loss from the body.The musculoskeletal system (also referred to separately as the muscle system and the skeletal system), composed of the skeletal muscles and bones (with about 206 of the latter in adults), moves the body and protectively houses its internal organs.The circulatory system, composed of the heart, blood, and blood vessels, circulates a transport fluid throughout the body, providing the cells with a steady supply of oxygen and nutrients and carrying away waste products such as carbon dioxide and toxic nitrogen compounds.The digestive system, composed of the mouth, esophagus, stomach, and intestines, breaks down food into usable substances (nutrients), which are then absorbed from the blood or lymph; this system also eliminates the unusable or excess portion of the food as fecal matter.The nervous system, composed of the sensory organs, brain, spinal cord, and nerves, transmits, integrates, and analyzes sensory information and carries impulses to effect the appropriate muscular or glandular responses.The endocrine system, composed of the hormone-secreting glands and tissues, provides a chemical communications network for coordinating various body processes.The reproductive system, composed of the male or female sex organs, enables reproduction and thereby ensures the continuation of the species. gorodenkoff//Getty ImagesHeres what youll learn when you read this story:Many known hominin fossils defy species classification, with the most famous example being the ever-enigmatic Denisovans. A study by anthropologists from the Chinese Academy of Sciences and the University of Hawaii suggests that many of these anthropological mysteries might in fact be members of a new species: Homo juluensis.This potential breakthrough occurred when the researchers were devising a new organizational system for fossils and discovered similarities among certain cranial and dental fossilsall with distinct differences from other hominin species.Although only one species of hominin (a tribe of the subfamily Homininae) exists on the planet todaygood ole Homo sapiensthe human family, throughout more geologically-recent Earth history, was comprised of a complex tableaux of members. And over the years, scientists have tried to get a clearer picture of that prehistoric story by excavating ancient human sites around the world. Now, anthropologists from the Chinese Academy of Sciences and the University of Hawaii are illustrating a previously unknownor, rather, uncategorizedchapter of that story with the introduction of a new human species, H. juluensis. The researchers published the details of this new species in the journals Nature Communications and PaleoAnthropology.Are Humanoid Hobbits Still Living?H. juluensisthe name for which means big headthrived in eastern Asia from 300,000 years ago to around 50,000 years ago, when the species died out. According to the researchers, this group likely hunted wild horses, fashioned stoned tools, and even processed animal hides to survive frigid winters. University of Hawaiis Christopher J. Bae said the breakthrough for discovering this possibly new species came when he and his team were devising a new system for organizing fossil evidence. Although we started this project several years ago, we did not expect being able to propose a new hominin (human ancestor) species and then to be able to organize the hominin fossils from Asia into different groups, Bae said in a press statement. This study clarifies a hominin fossil record that has tended to include anything that cannot easily be assigned to Homo erectus, Homo neanderthalensis or Homo sapiens.One possible member of the new species H. juluensis isnt a newcomer to science by any stretch. Denisovansfirst identified in 2010 via DNA extracted from a young girls fingerbone found in Siberiahave never been given a species classification, but Bae believes that they could belong to this new species. Can Hibernation Cure Human Diseases?H. juluensis also potentially solves another mystery of the Xujiayao hominin fossils, which have long perplexed researchers, as the remains display a mix of H. erectus and H. sapiens features. According to a study by the scientists in the journal PaleoAnthropology, these remains have been confused for a variety of taxonomic representations, but note that differences in the cranium (spoiler: its big), the teeth and jaws, and a few other features denote a new species represented in fossil remains including Penghu 1 (jawbone), Xiahe (mandible), Xuchang (partial crania), and a variety of Denisova fossils. Although this is a convincing argument that these particular specimens belong to a previously unknown human species, more research will be needed before anthropologists bust out the Welcome to the Family banners. But because these fossils still defy species classification, its likely only a matter of time before the hominin tribe increases by one (or more).Darren OrfContributing EditorDarren lives in Portland, has a cat, and writes/edits about sci-fi and how our world works. You can find his previous stuff at Gizmodo and Paste if you look hard enough.In this new series, paleoanthropologist Ella Al-Shamahi reveals humanity's incredible story across 300,000 years of human evolution and how thanks to new discoveries we're learning that the story is stranger and more surprising than we ever imagined. When Homo sapiens emerged in Africa we were not alone: there were at least six other human species alive at the time. Human examines how we went from being just one of many types of human to the dominant form of life on the planet.The extraordinary story of how the human species, Homo sapiens, first emerged, where the discoveries of recent years are revolutionising the understanding of humanity's origin story.The extraordinary story of how the human species, Homo sapiens, first emerged, where the discoveries of recent years are revolutionising the understanding of humanity's origin story.Following early Homo sapiens's ancestors as they step out of Africa and venture into the wider world, into areas inhabited by other human species.Following early Homo sapiens's ancestors as they step out of Africa and venture into the wider world, into areas inhabited by other human species.Shocking new insights into the demise of modern humans' sister species, the Neanderthals, Homo sapiens's possible role in their downfall and how it become the last human species on Earth.Shocking new insights into the demise of modern humans' sister species, the Neanderthals, Homo sapiens's possible role in their downfall and how it become the last human species on Earth.During the height of the Ice Age, one of the coldest times humanity has ever known, Homo sapiens steps into the last habitable continents on the planet: the Americas.During the height of the Ice Age, one of the coldest times humanity has ever known, Homo sapiens steps into the last habitable continents on the planet: the Americas. What defines humanity? Is it the fact that we can walk upright on two legs? That we have brains big enough to use tools? That we can organize our societies well enough to find wonderful ways of exploiting the resources of the planet and each other?While the answer may seem clear enough to anyone who doesnt think too closely about it, anthropologists the scientists who actually study humans arent necessarily so certain.Were using this term and its not quite colloquial and its not quite scientific either, says Sheela Athreya, a biological anthropologist at Texas A&M University. It also depends on what exactly youre talking about when you use the word human.What Is a Hominin?Australopithecus afarensis reconstruction, Natural Science Museum - Muse - Trento, Italy. (Credit: Lorenza62)The definition of a hominin is perhaps the widest definition of what constitutes a human. Basically, a hominin is a primate that walks on two feet.Just the same, there is still some disagreement about which species qualify as hominins, especially the further back you go. For example, take Orrorin tugenensis, a species whose remains have been found in Kenya dating back about 6 million years. Some researchers believe this species was bipedal, which would make them the earliest known hominins, although others arent so sure.Read More: An Ancient Skull Could Prompt the Founding of a New Human SpeciesOther ancient hominins include Australopithecus. Researchers have categorized a number of different species within this genus, including the well-known Lucy, an Australopithecus afarensis whose fossil remains were discovered in Ethiopia. While it would take more evidence to prove, some anthropologists believe that Orrorin or Australopithecus may be distant ancestors of later hominins such as Homo erectus, H. sapiens, Neanderthals and Denisovans.What Does Homo Mean?Prehistoric ancestors of man, homo erectus. (Credit: frantic00) The word Homo as applied in anthropology comes from the Latin word for human. By this definition, even the oldest of this genus that dates back at least 2 million years Homo habilis would be human, as would Neanderthals, Denisovans and H. erectus.Just as with early hominins, scientists havent yet reached consensus on what constitutes the genus Homo, however. Still under dispute, for example, is whether Homo erectus evolved directly from Homo habilis, or whether they both evolved roughly around the same time from a common ancestor.Some researchers even believe Homo habilis should belong in the Australopithecus category rather than in the Homo genus.Read More: The 3-Million-Year-Old Lucy Was Built Like a PowerlifterIn any case, one thing that distinguishes Homo erectus, for the most part, is that it was the first hominin yet known to leave Africa. Athreya says that this distinction represents one of the biases among scholars.Once we have a dispersal out of Africa, which we call Homo erectus, we start comparing them to more human-like things, she says, such as relying on tools or adapting to non-equatorial climates. By contrast, many researchers compare hominins before Homo erectus to apes rather than modern humans.What Are Modern Humans?Skull and Neanderthal sculpture. (Credit: LegART/Shutterstock)Getting closer to what we are today doesnt necessarily make a clear definition any easier. When Neanderthals and Denisovans were first discovered, researchers believed they were something else entirely.For a time, some researchers even used the redundant-sounding term Homo sapiens sapiens to separate us from Neanderthals, which are sometimes classified as Homo sapiens neanderthalensis. In common English, researchers separated us from Neanderthals by using the word anatomically modern humans. This more or less refers to such physical features as a lack of brow ridges, less-sloped forehead, and smaller teeth that humans have compared to Neanderthals.Read More: Who Were the Neanderthals? But more recently, genetic analysis has revealed that even modern humans, whose ancestors migrated out of Africa, have up to 4 percent Neanderthal DNA. So, to some degree, many Europeans, Asians and Americans are partly made up of Neanderthal genes. I cant say Denisovans or Neanderthals are a real thing and here are its parameters, Athreya says, adding that the arguments for these classifications dont have empirical or philosophical strength to them.Some of the difficulty here lies within the problem of dividing species in general. If all species are constantly evolving, at what point do we say theyve become something else?Are Humans Too Biased to Classify Ourselves?(Credit: Master1305/Shutterstock)In other cases, the problem lies more with the biases of the people who made or support these classifications. The crux of this problem, as far as Athreya is concerned, comes from the fact that anthropologists studying the range of variation in hominins have for generations come from a single background European.Being a brown, non-Christian paleontologist gives Athreya a unique perspective, she says. If Indigenous Australians or Papuans were leading the conversation, for example, the way that we categorize all the categories and subcategories of hominins would likely look quite different.You have the field taken over by people who have very little knowledge on the true range of human variation, both genetic and biological, she says. A fuller examination of the total variation in traits and genes that humans have might give some researchers a new perspective on the issue and on the definition of the word human.Read More: Its Time to Expand Our Definition of Human BeingArticle SourcesOur writers at Discovermagazine.com use peer-reviewed studies and high quality sources for our articles, and our editors review for accuracy, and trustworthiness. Review the sources used below for this article:In biological terms, a human being, or human, is any member of the mammalian species Homo sapiens, a group of ground-dwelling, tailless primates that are distributed worldwide and are characterized by bipedalism and the capacity for speech and language, with an erect body carriage that frees the hands for manipulating objects. Humans share with other primates the characteristics of opposing thumbs, omnivorous diet, five fingers (pentadactyl) with fingernails, and binocular, color vision. Humans are placed in the family Hominidae, which includes such apes as chimpanzees, gorillas, and orangutans, as well as including such close, extinct relatives as Australopithecus, Homo habilis, and Homo erectus. However, human beings not only define themselves biologically and anatomically, but also in psychological, social, and spiritual terms. Psychologically, humans have a highly developed brain capable of abstract reasoning, language, and introspection. Humans also are noted for their desire to understand and influence the world around them, seeking to explain and manipulate natural phenomena through science, philosophy, mythology, and religion. Humans also have a marked appreciation for beauty and aesthetics, and can use art, music, and literature to express concepts and feelings. Their mental capability, natural curiosity, and anatomy has allowed humans to develop advanced tools and skills; humans are the only known species to build fires, cook their food, clothe themselves, and use numerous other technologies. Humans are inherently social animals, like most primates, but are particularly adept at utilizing systems of communication for self-expression, the exchange of ideas, and organization. They create complex social structures of cooperating and competing groups, ranging in scale from small families and partnerships to species-wide political, scientific, and economic unions, including complex systems of governance. Social interactions between humans have also established an extremely wide variety of traditions, rituals, ethics, values, social norms, and laws that form the basis of human society. Their ability to appreciate beauty and aesthetics, combined with the human desire for self-expression, has led to cultural innovations such as art, literature and music. Humans are notable for practicing altruistic behaviors not only towards relatives, but also others, including sometimes enemies and competitors. Males and females form monogamous pair bonds and raise their young in families where both parents protect and educate the youngsters. Humans have extended parental care, and pass on many attributes socially to their young. Spiritually, humans have historically formed religious associations, characterized by belief in God, gods, or spirits, and by various traditions and rituals. Many religious perspectives emphasize soul, spirit, qi, or atman as the essence of a human being, with many holding that this inner essence survives the death of the physical body. For many, it is this inner essence that explains the unique psychological and social aspects of humans and is the principle characteristic differentiating humans from other animals.Humans as primatesHumans are classified in the biological order Primates, a group of mammals containing all the species commonly related to the lemurs, monkeys, and apes. Primates are characterized by being anatomically unspecialized, with limbs capable of performing a variety of functions, refined five-digit hands adapted for grasping (including opposable thumbs), comparatively flattened snouts, and prolonged pre and postnatal development, among other features. All primates have five fingers (pentadactyl) that are long and inward closing, short fingernails (rather than claws), and a generalized dental pattern. While opposing thumbs are a characteristic primate feature, this feature is not limited to this order; opossums, for example, also have opposing thumbs. Primates are omnivorous (generalized feeders that consume both animal protein and vegetation).Primates are informally arranged into three groups: (1) prosimians, (2) monkeys of the New World, and (3) monkeys and apes of the Old World. Humans belong to the third group of primates, and specifically those primates known as apes. Apes are those primates placed in the superfamily Hominoidea of the same clade Catarrhini; the Old World monkeys are placed in the superfamily Cercopithecoidea in the clade, or parvorder, Catarrhini. Apes consist of the various species of gibbons (or "lesser apes"), as well as gorillas, chimpanzees, bonobos, orangutans, and humans (collectively referred to as the "great apes"). From the point of view of superficial appearance, all living members of apes are tailless, while most Old World monkeys have tails. However, there are also primates in other families that lack tails. More specifically, the apes can be distinguished from the Old World monkeys by the number of cusps on their molars (apes have fivethe "Y-5" molar pattern, Old World monkeys have only four in a "bilophodont" pattern). Apes have more mobile shoulder joints and arms, ribcages that are flatter front-to-back, and a shorter, less mobile spine compared to Old World monkeys. A common taxonomic scheme divides the apes, or hominoids, into two families:The family Hylobatidae consists of 4 genera and 12 species of gibbons, collectively known as the "lesser apes"The family Hominidae consisting of gorillas, chimpanzees, orangutans, and humans, collectively known as the "great apes"Members of the family Hominidae are called hominids by many systematists. Since recent classification schemes for the apes place extinct and extant humans, chimpanzees, gorillas, and orangutans in Hominidae, technically hominid refers to members of these groups. However, historically and even in some current classification schemes, Hominidae is restricted to humans and their close, extinct relativesthose more similar to humans than to the (other) great apes, which were placed in another family. Thus, there is a tradition, particularly in anthropology, of using the term hominid to refer only to humans and such forebears as Australopithecus, Homo habilis, and Homo erectus. In this sense, humans are considered the only surviving hominids. Based on purely biological aspects (morphology, DNA, proteins, and so on), it is clear the humans are primates. Indeed, humans and chimpanzees share more than 98 percent identity by various molecular comparisons (protein sequences, allele differences, DNA nucleotide sequences) (Wood 2006; King and Wilson 1975). Biologists believe that the two species of chimpanzees, Pan troglodytes and Pan paniscus, are the closest living evolutionary relatives to humans. The anatomical and biochemical similarity between chimpanzees and humans is so striking that some scientists even have proposed that the two chimpanzee species be placed with sapiens in the genus Homo, rather than in Pan. One argument for this suggested reclassification is that other species have been reclassified to belong to the same genus on the basis of less genetic similarity than that between humans and chimpanzees. For example, Ebersberger et al. (2002) found a difference of only 1.24 percent when he aligned 1.9 million nucleotides of chimpanzee DNA and compared them with the corresponding human sequences in the human genome (Wood 2006). Using a 4.97 million nucleotide portion of DNA from human chromosome 7 and comparing to chimpanzee orthologies yielded only 1.13 percent mismatches (Liu et al. 2003). Likewise, a comparison of a rough draft of the chimpanzee genomeinvolving 361,782 contiguous fragments with a medium length of 15,700 nucleotides, covering about 94 percent of the chimpanzee genomewith the human genome, for those sequences that could be aligned, averaged 1.23 percent nucleotide mismatches (The Chimpanzee Sequencing and Analysis Consortium 2005). Comparison of chimpanzee exons and human sequences yielded only 0.6 to 0.87 percent differences (Wildman et al. 2003; Nielsen et al. 2005). For a more detailed discussion of this, see Chimpanzees and humans.Uniqueness of human beingsBecause humans are classified as primates and because apes are considered to be our biological ancestors, there is a modern tendency to consider humans as "just another primate" or "nothing but an animal." Indeed, the physical similarity between humans and other members of the "great apes" is so striking that efforts are underway to treat apes as "persons" with various human-like "rights." (See cultural aspects of non-human apes.) However, despite the remarkable physical similarity, the gulf between humans and other great apes (and other animals in general) is qualitatively huge, in terms of cultural, psychological (including emotional and mental characteristics), and spiritual aspects. Humans have a complex language, use symbols in communication, write and read books, have set up diverse systems of governance, have remarkable self-awareness, conduct scientific experiments, practice religious traditions, have developed complex technologies, and so forth. As noted by eminent evolutionist Ernst Mayr, "Man is indeed unique, as different from all other animals, as has been traditionally claimed by theologians and philosophers" (Mayr 2001).Language, involving syntax and grammar, is one notably unique characteristics of humans. Other animals species that sometimes are said to have a "language"such as the "language of bees"merely have systems of giving and receiving signals; they lack a system of communication with syntax and grammar, which is required to properly be a language (Mayr 2001, p. 253). Thus, chimpanzees, despite decades of attempts to teach them language, cannot talk about the future or the past; they seem to lack the ability to adopt syntax (Mayr 2001).Other animals have intelligence and think, including highly developed intelligence in various mammals and birds (corvids, parrots, and so on) (Mayr 2001). But human intelligence is greater by orders of magnitude. Humans have self-awareness, can reason abstractly, are capable of introspection, and appreciate beauty and aesthetics. They desire to understand the world, including both past, present, and future, and even study other animals and themselves. They have developed complex systems of governance and law, established sciences, and express feelings through art, music, and literature. They have developed complex technologies. Human beings, unlike any other animals, transfer a great deal of cultural information, utilizing language in the process. Many animals, such as most invertebrates, do not even have any relationship with their parents, which die before their are hatched, and thus the parents do not transmit information to their offspring. Humans, on the other hand, form monogamous pair bonds and have extensive parental care, raising their young in families where both parents educate the youngsters. However, even in species with highly developed parental care, such as in certain mammals and birds, the amount of information that is handed down from generation to generation (nongenetic information transfer) is quite limited (Mayr 2001, 253). For humans, there is a great deal of information that is transferred. Unlike chimpanzee young, which become independent of their mothers within the first year of life, human young require many years to reach maturity, during which the parents transmit language, culture, and skills that make up the greater part of human personhood. Information is even transferred by the use of symbols, and in written languages in books.Humans beings also practice altruism, not only for the benefit of an individual's own offspring, or the close relatives, or members of the same social group, but even towards outsiders and competitors or enemies. In chimpanzees, there is a practice of maiming or killing of former alpha males after they have been supplanted by a new leader. Human males, on the other hand, typically protect the children of other families of their tribe, and former male leaders are respected as honored elders. Respect for elderly males, codified in human morality as filial piety, is another means by which humans propagate and transmit culture. Many religious hold that the most essential characteristic that makes humans unique is an immaterial essence: A soul, spirit, atman, qi, or so forth. It is this inner aspect that is considered to separate humans from animals. For example, there is a concept that humans have not only a physical body with physical senses, but also an immaterial or spiritual body with spiritual senses. This spiritual body is considered to mirror the appearance of the physical body, but also exists after the death of the material form. An example of such is found in the Bible: "It is sown a physical body, but it is raised a spiritual body. If there is a physical body, there is also a spiritual body" (1 Corinthians 15:44). Thus, although there are close anatomical similarities between humans and other primates, particularly chimpanzees, the gap between humans and apes in terms of culture, mental capacity, and various spiritual, emotional, and technological aspects is so large as to dwarf differences between apes and other animals. In this sense, philosophers have recognized humans as distinct from animals generally.The name Homo sapiens is Latin for "wise human" or "knowing human," emphasizing the importance of intelligence in separating humans and other animals. Mayr (2001) states that "it has long been appreciated that it is our brain that makes us human. Any other part of our anatomy can be matched or surpassed by a corresponding structure in some other animal." However, many theologians and philosophers would emphasize the inner aspects of humans as the most distinctive factor, or emphasize the essence of humans in the ability to love.BiologyGenetics and physiologySee also: Human body An old diagram of a male human skeleton.Humans are an eukaryotic species. Each diploid cell has two sets of 23 chromosomes, each set received from one parent. There are 22 pairs of autosomes and one pair of sex chromosomes. By present estimates, humans have approximately 20,00025,000 genes. Like other mammals, humans have an XY sex-determination system, so that females have the sex chromosomes XX and males have XY. The X chromosome is larger and carries many genes not on the Y chromosome, which means that recessive diseases associated with X-linked genes, such as hemophilia, affect men more often than women.Human body types vary substantially. Although body size is largely determined by genes, it is also significantly influenced by environmental factors such as diet and exercise. The average height of an adult human is about 5 to 6feet (1.5 to 1.8 meters) tall, although this varies significantly from place to place (de Beer 2004). Humans are capable of fully bipedal locomotion, thus leaving their arms available for manipulating objects using their hands, aided especially by opposable thumbs. Although humans appear relatively hairless compared to other primates, with notable hair growth occurring chiefly on the top of the head, underarms, and pubic area, the average human has more hair follicles on his or her body than the average chimpanzee. The main distinction is that human hairs are shorter, finer, and less heavily pigmented than the average chimpanzee's, thus making them harder to see (Wade 2003).Skin color, hair color, and "races" An Inuit woman, circa 1907.The hue of human hair and skin is determined by the presence of pigments called melanins. Human skin hues can range from very dark brown to very pale pink, while human hair ranges from blond to brown to red to, most commonly, black (Rogers et al. 2004). The differences in skin color between various people is due to one type of cell, the melanocyte. The number of melanocytes in human skin is believed to be the same for all people. However, the amount of pigment, or melanin, within the melanocytes is different. People with black skin have the most pigment and people with white skin have the least amount of pigment (Astner and Anderson 2004). Many researchers believe that skin darkening was an adaptation that evolved as a protection against ultraviolet solar radiation, as melanin is an effective sun-block (Jablonski and Chaplin 2000). The skin pigmentation of contemporary humans is geographically stratified, and in general correlates with the level of ultraviolet radiation. Human skin also has a capacity to darken (sun tanning) in response to exposure to ultraviolet radiation (Harding et al. 2000; Robins 1991).Historically, efforts have been made to designate various human populations as distinct "races" based on skin color, along with such other observable physical traits as hair type, facial features, and body proportions. However, today many scientists from diverse fields, such as genetics, physical anthropology, sociology, and biology, believe that the concept of distinct human races is unscientific and that there are no distinct races as previously claimed (O'Campo 2005; Keita et al. 2004). The concept of "race" is a valid taxonomic concept in other species. However, in humans only a small proportion of the genetic variability of humans occurs between so-called races, there is much greater variability among members of a race than between members of different races, and racial traits overlap without discrete boundariesmaking genetic differences among groups biologically meaningless (O'Campo 2005; Schwartz and Vissing 2002; Smedley and Smedley 2005; Lewontin 1972). In addition, so-called races are freely interbreeding. On the other hand, other geneticists argue that categories of self-identified race/ethnicity or biogeographic ancestry are both valid and useful (Risch et al. 2002; Bamshad 2005), and that arguments against delineating races could also be made regarding making distinctions based on age or sex (Risch et al. 2002). Rather than delineating races, there is a current tendency to identify ethnic groups, with members defined by shared geographical origin or cultural history, such as common language and religion (O'Campo 2005), and there is a tendency to recognize a graded serious of differences (a cline) along geographical or environmental ranges. The recognition of different races, along with preferences toward particular groups, or exploitation or domination of other groups, is sometimes identified with the term racism. From a biological point of view, in which species are recognized as actually or potentially interbreeding natural populations, one might define someone as a "racist" on the basis of whether the person is willing to marry, and to have their children marry, someone of any other "race." From a biblical point of view, all people are descended from one common pair of ancestors (O'Campo 2005). From the point of view of some religions, the essential part of humans is the soul, which counters a fixation on physiology and observable physical characteristics alone (O'Campo 2005).Life cycleThe human life cycle is similar to that of other placental mammals. New humans develop viviparously (live birth) from fertilization of an egg by a sperm (conception). An egg is usually fertilized inside the female by sperm from the male through sexual intercourse, though the recent technology of in vitro fertilization is occasionally used. The fertilized egg, called a zygote, divides inside the female's uterus to become an embryo that is implanted on the uterine wall. The fetal stage of prenatal development (fetus) begins about seven or eight weeks after fertilization, when the major structures and organ systems have formed, until birth. After about nine months of gestation, the fully-grown fetus is expelled from the female's body and breathes independently as a "neonate" or infant for the first time. At this point, most modern cultures recognize the baby as a person entitled to the full protection of the law, though some jurisdictions extend personhood to human fetuses while they remain in the uterus.Compared with that of other species, human childbirth can be dangerous. Painful labors lasting twenty-four hours or more are not uncommon, and may result in injury, or even death, to the child and/or mother. This is because of both the relatively large fetal head circumference (for housing the brain) and the mother's relatively narrow pelvis (a trait required for successful bipedalism (LaVelle 1995; Correia et al. 2005). The chances of a successful labor increased significantly during the 20th century in wealthier countries with the advent of new medical technologies. In contrast, pregnancy and natural childbirth remain relatively hazardous ordeals in developing regions of the world, with maternal death rates approximately 100 times more common than in developed countries (Rush 2000).In developed countries, infants are typically 34 kilograms (69 pounds) in weight and 5060 centimeters (2024 inches) in height at birth. However, low birth weight is common in developing countries, and contributes to the high levels of infant mortality in these regions (Khor 2003). Helpless at birth, humans continue to grow for some years, typically reaching sexual maturity at 12 to 15 years of age. Human girls continue to grow physically until around the age of 18, and human boys until around age 21. The human life span can be split into a number of stages: infancy, childhood, adolescence, young adulthood, adulthood, and old age. The lengths of these stages, however, are not fixed, and particularly the later stages.There are striking differences in life expectancy around the world, ranging from as high as over 80 years to less than 40 years. The number of centenarians (humans of age 100 years or older) in the world was estimated at nearly half a million 2015 (Stepler 2016). At least one person, Jeanne Calment, is known to have reached the age of 122 years; higher ages have been claimed but they are not well substantiated. Worldwide, there are 81 men aged 60 or older for every 100 women of that age group, and among the oldest, there are 53 men for every 100 women.The philosophical questions of when human personhood begins and whether it persists after death are the subject of considerable debate. The prospect of death causes unease or fear for most humans. Burial ceremonies are characteristic of human societies, often accompanied by beliefs in an afterlife or immortality.DietEarly Homo sapiens employed a "hunter-gatherer" method as their primary means of food collection, involving combining stationary plant and fungal food sources (such as fruits, grains, tubers, and mushrooms) with wild game, which must be hunted and killed in order to be consumed. It is believed that humans have used fire to prepare and cook food prior to eating since possibly the time of Homo erectus. Humans are omnivorous, capable of consuming both plant and animal products. The view of humans as omnivores is supported by the evidence that both a pure animal and a pure vegetable diet can lead to deficiency diseases in humans. A pure animal diet can, for instance, lead to scurvy, while a pure plant diet can lead to deficiency of a number of nutrients, including Vitamin B12. Some humans have chosen to abstain from eating some or all meat for religious, ethical, ecological, or health reasons. Supplementation, particularly for vitamin B12, is highly recommended for people living on a pure plant diet. The human diet is prominently reflected in human culture, and has led to the development of food science.In general, humans can survive for two to eight weeks without food, depending on stored body fat. Survival without water is usually limited to three or four days, but longer periods are known, including fasting for religious purposes. Lack of food remains a serious global problem, with about 300,000 people starving to death every year. Childhood malnutrition is also common and contributes to the global burden of disease (Murray and Lopez 1997). However global food distribution is not even, and obesity among some human populations has increased to almost epidemic proportions, leading to health complications and increased mortality in some developed, and a few developing countries. Obesity is caused by consuming more calories than are expended, with many attributing excessive weight gain to a combination of overeating and insufficient exercise.At least ten thousand years ago, humans developed agriculture (see rise of civilization below), which has substantially altered the kind of food people eat. This has led to increased populations, the development of cities, and because of increased population density, the wider spread of infectious diseases. The types of food consumed, and the way in which they are prepared, has varied widely by time, location, and culture.HistoryOrigin of Homo sapiens sapiens (modern humans)For more details on this topic, see Human evolution.The scientific study of human evolution concerns the emergence of humans as a distinct species. It encompasses the development of the genus Homo, as well as studying extinct human ancestors, such as the australopithecines, and even chimpanzees (genus Pan), which are usually classified together with genus Homo in the tribe Hominini. "Modern humans" are defined as the Homo sapiens species, of which the only extant subspecies is Homo sapiens sapiens.There is substantial evidence for a primate origin of humans (Mayr 2001):Anatomical evidence: Human beings exhibit close anatomical similarities with the African apes, and particularly the chimpanzee. Compared to apes, the few unique physical characteristics of humans are the proportion of arms and legs, opposable thumbs, body hair, skin pigmentation, and size of the central nervous system, such as the forebrain.Fossil evidence: Numerous fossils have been found sharing human and primate characteristics.Molecular evidence: Human molecules are very similar to that of chimpanzees. In some, such as hemoglobin, they are virtually identical.The closest living relatives of Homo sapiens are two distinct species of the genus Pan: the bonobo (Pan paniscus) and the common chimpanzee (Pan troglodytes). Through a study of proteins, comparison of DNA, and use of a molecular clock (a method of calculating evolution based on the speed at which genes mutate), scientists believe thePan/Homo split happened about 5 to 8 million years ago (Mayr 2001, Physorg 2005). (See Pan/Homo split.) Well-known members of the Homo genus include Homo habilis (about 2.4 to 1.5 mya), Homo erectus (1.8 mya to 70,000 years ago), Homo heidelbergensis (800,000 to 300,000 years ago), and Homo neanderthalensis (250,000 to 30,000 years ago). H. sapiens have lived from about 250,000 years ago to the present. Between 400,000 years ago and the second interglacial period in the Middle Pleistocene, around 250,000 years ago, the trend in cranial expansion and the elaboration of stone tool technologies developed, providing evidence for a transition from H. erectus to H. sapiens. Based on molecular evidence, the calculation of the time of divergence of all modern human populations from a common ancestor typically yields dates around 200,000 years (Disotell 1999). Notably, however, about 50,000 to 40,000 years ago, human beings appeared to have taken a Great Leap Forward, when human culture apparently changed at a much greater speed. Humans started to bury their dead carefully, made clothing out of hides, developed sophisticated hunting techniques (such as pitfall traps, or driving animals to fall off cliffs), and made cave paintings. Additionally, human culture began to become more technologically advanced, in that different populations of humans begin to create novelty in existing technologies. Artifacts such as fish hooks, buttons, and bone needles begin to show signs of variation among different population of humans, something what had not been seen in human cultures prior to 50,000 BP. This "Great Leap Forward" seems connected to the arrival of modern humans beings: Homo sapiens sapiens. (See modern man and the great leap forward.)The Cro-Magnons form the earliest known European examples of Homo sapiens sapiens.The term falls outside the usual naming conventions for early humans and is used in a general sense to describe the oldest modern people in Europe. Cro-Magnons lived from about 40,000 to 10,000 years ago in the Upper Paleolithic period of the Pleistocene epoch. For all intents and purposes these people were anatomically modern, only differing from their modern day descendants in Europe by their slightly more robust physiology and larger brain capacity than that of modern humans. When they arrived in Europe about 40,000 years ago, they brought with them sculpture, engraving, painting, body ornamentation, music, and the painstaking decoration of utilitarian objects.Current research establishes that human beings are highly genetically homogeneous, meaning that the DNA of individual Homo sapiens is more alike than usual for most species. Geneticists Lynn Jorde and Henry Harpending of the University of Utah, noting that the variation in human DNA is minute compared to that of other species, propose that during the Late Pleistocene, the human population was reduced to a small number of breeding pairsno more than 10,000 and possibly as few as 1,000resulting in a very small residual gene pool. Various reasons for this hypothetical bottleneck have been postulated, one of those is the Toba catastrophe theory.There are two major scientific challenges in deducing the pattern of human evolution. For one, the fossil record remains fragmentary. Mayr (2001) notes that no fossils of hominids have been found for the period between 6 and 13 million years ago (mya), the time when branching between the chimpanzee and

even be said to control, human behavior, though historically many cultures and philosophers have for various reasons discouraged allowing this influence to go unchecked.Emotional experiences perceived as pleasant, like love, admiration, or joy, contrast with those perceived as unpleasant, like hate, envy, or sorrow. There is often a distinction seen between refined emotions, which are socially learned, and survival oriented emotions, which are thought to be innate.Human exploration of emotions as separate from other neurological phenomena is worthy of note, particularly in those cultures where emotion is considered separate from physiological state. In some cultural medical theories, to provide an example, emotion is considered so synonymous with certain forms of physical health that no difference is thought to exist. The Stoics believed excessive emotion was harmful, while some Sufi teachers (in particular, the poet and astronomer Omar Khayym) felt certain extreme emotions could yield a conceptual perfection, what is often translated as ecstasy.In modern scientific thought, certain refined emotions are considered to be a complex neural trait of many domesticated and a few non-domesticated mammals. These were commonly developed in reaction to superior survival mechanisms and intelligent interaction with each other and the environment; as such, refined emotion is not in all cases as discrete and separate from natural neural function as was once assumed. Still, when humans function in civilized tandem, it has been noted that uninhibited acting on extreme emotion can lead to social disorder and crime.Love and sexualityFor more details on this topic, see Loveand Human sexuality. The Kiss by Francesco Hayez, 1859Humans are known for forming monogamous pair bonds and for extensive parental care, establishing families of parents and children. They also are known for relationships based on "love."Love is any of a number of emotions and experiences related to a sense of strong affection or profound oneness. Depending on context, love can have a wide variety of intended meanings, including sexual attraction. Psychologists and religious teachings, however, define love more precisely, as living for the sake of another, motivated by heart-felt feelings of caring, affection, and responsibility for the other's well-being. Perhaps the best context in which to develop such love is the family, where the love that is given and received is of various kinds. Love can involve the sacrifice and investment that parents willingly give on behalf of their children, and children, in turn, can offer their parents filial devotion and respect. Siblings can care for and help one another in various ways. The love between spouses is a world in itself. Grandparents typically bear a profound regard for their grandchildren. All of these types of love have their distinctive features. Although love is universally desired, it can be fraught with infidelity, deceit, possessiveness, unrealistic expectations, jealousy, and hate. Love, in fact, is at the root of much pain and conflict in the world. Marriages break down when the passion of romance cools. Human sexuality refers to the expression of sexual sensation and related intimacy between human beings. Biologically, it is the means through which a child is conceived and the lineage is passed on to the next generation. However, besides ensuring biological reproduction, human sexuality has important social functions: It creates physical intimacy, bonds, and hierarchies among individuals; may be directed to spiritual transcendence (according to some traditions); and in a hedonistic sense to the enjoyment of activity involving sexual gratification. Psychologically, sexuality is the means to express the fullness of love between a man and a woman. There are a great many forms of human sexuality, comprising a broad range of behaviors, and sexual expression varies across cultures and historical periods. Yet the basic principles of human sexuality are universal and integral to what it means to be human. Sex is related to the very purposes of human existence: love, procreation, and family. Sexuality has social ramifications; therefore most societies set limits, through social norms and taboos, moral and religious guidelines, and legal constraints on what is permissible sexual behavior. As with other human self-descriptions, humans propose that it is high intelligence and complex societies of humans that have produced the most complex sexual behaviors of any animal, including a great many behaviors that are not directly connected with reproduction.Some scientists and layman hold that human sexuality is not innately monogamous nor by nature exclusively heterosexual (between a man and a woman). For example, Alfred Kinsey, a sex researcher, speculates that people can fall anywhere along a continuous scale of sexual orientation, with only small minorities fully heterosexual or homosexual), while other scientists speculate based on neurology and genetics that people may be born with one sexual orientation or another (Buss 2003; Thornhill and Palmer 2000). Social Darwinism has been used in speculating that it is the natural state of human beings for males to be promiscuous in order to try to widely spread their genes, while females are naturally monogamous, seeking a stable male presence to help during pregnancy and in rearing children given the extensive parental care involveda concern about reproduction from which women have been freed recently by various forms of contraception. However, there are a wide body of authorities likewise who maintain that humans are by nature monogamous and heterosexual, as seen in the tradition of pair bonding and families throughout history. For example, the world's major religions concur in viewing sexual intimacy as proper only within marriage; otherwise, it can be destructive to human flourishing. A common religious perspective is to view promiscuous and non-heterosexual behavior as deviating from the original human nature, and in Christianity such behaviors traditionally are seen as sin that are tied to separation from Goda separation epitomized in the Fall of Man. In psychology, homosexuality was listed for some time as a psychological disorder, although this has fallen into disfavor, and marriage counselors strive to find ways to strengthen marriage and love rather than promote promiscuity. From a more medical point of view, promiscuity is linked to various sexually transmitted diseases and even greater incidents of some forms of cancer, leading to the speculation that it is not an advantageous state for humans. The rationale for traditional moral strictures on sexuality, in general, is that a sexual activity can express committed love or be a meaningless casual event for recreational purposes. Yet sexual encounters are not merely a physical activity like enjoying good food. Sex involves the partners in their totality, touching their minds and hearts as well as their bodies. Therefore, sexual relations have lasting impact on the psyche. Sexuality is a powerful force that can do tremendous good or terrible harm; therefore it carries with it moral responsibility.CultureFor more details on this topic, see Culture.Culture is defined here as a set of distinctive material, intellectual, emotional, and spiritual features of a social group, including art, literature, value systems, traditions, rituals, lifestyles, and beliefs. The link between human biology and human behavior and culture is often very close, making it difficult to clearly divide topics into one area or the other; as such, the placement of some subjects may be based primarily on convention.Culture consists of values, social norms, and artifacts. A culture's values define what it holds to be important or ethical. Closely linked are norms, expectations of how people ought to behave, bound by tradition. Artifacts, or "material culture," are objects derived from the culture's values, norms, and understanding of the world.The mainstream anthropological view of "culture" implies that most people experience a strong resistance when reminded that there is an animal as well as a spiritual aspect to human nature (Benthall 2007).LanguageFor more details on this topic, see Language.The capacity humans have to transfer concepts, ideas, and notions through speech and writing is unrivaled in known species. The faculty of speech is a defining feature of humanity, possibly predating phylogenetic separation of the modern population. Language is central to the communication between humans, as well as being central to the sense of identity that unites nations, cultures, and ethnic groups.The invention of writing systems about 5000 years ago allowed the preservation of language on material objects, and was a major step in cultural evolution. Language is closely tied to ritual and religion (cf. mantra, sacred text).The science of linguistics describes the structure of language and the relationship between languages. There are approximately 6,000 different languages currently in use, including sign languages, and many thousands more that are considered extinct.Human self reflection leads to the understanding of the origins of human beings.Prehistoric notions about the status of humanity may be guessed by the etymology of ancient words for man. Latin homo (PIE *konyon) means "of the earth, earthling," probably in opposition to "celestial" beings. Greek (mycenaean *anthrokwos) means "low-eyed," again probably contrasting with a divine perspective.Ancient Orient. From the third millennium B.C.E. Old Kingdom of Egypt, belief in the eternal afterlife of the human Ka (Egyptian soul) is documented. From the earliest times, people made a claim of dominance of humanity alongside radical pessimism because of the frailty and brevity of human life (In the Hebrew Bible, for example, dominion of man is promised in Genesis 1:28, but the author of Ecclesiastes bewails the vanity of all human effort).Classical antiquity. Protagoras made the famous claim that, "Man is the measure of all things; of what is, that it is; of what is not, that it is not." Socrates gave the (doubtlessly tongue-in-cheek) definition of humans as "featherless bipeds" (Plato, Politicus). More serious is Aristotle's description of the human as the "communal animal" ( ), in other words, emphasizing society-building as a central trait of human nature, and "animal with sapience" (o , animal rationale), a term that also inspired the species' taxonomy, Homo sapiens.Middle Ages. The dominant worldview of medieval Europe, as guided by the Catholic Church, was that human existence is characterized by sin, and that its aim should be to prepare for divine judgment after death. The thirteenth century pope Innocent III wrote about the essential misery of earthly existence in his "On the misery of the human condition"a view that was disputed by, for example, Gianozzo Manetti in his treatise, "On human dignity."Renaissance. A famous quote of Shakespeare's Hamlet (II, ii, 115-117), expressing the contrast of human physical beauty, intellectual faculty, and ephemeral nature: "What a piece of work is a man! How noble in reason! how infinite in faculties! in form and moving, how express and admirable! in action how like an angel! in apprehension, how like a god! the beauty of the world! the paragon of animals! And yet, to me, what is this quintessence of dust?"Modern era. The Enlightenment was driven by a renewed conviction, that, in the words of Immanuel Kant, "Man is distinguished above all animals by his self-consciousness, by which he is a 'rational animal'." In the nineteenth century, Karl Marx defined man as "laboring animal" (animal laborans) in conscious opposition to this tradition. In the early twentieth century, Sigmund Freud countered positivism by postulating that human behavior is to a large part controlled by the unconscious mind.Some feel that the modern culture of materialism leaves little room for reflection; the tendency to focus on worldly goods naturally denies the opportunity to ponder one's life and its place in the universe. The idea of philosophy being discarded as it runs counter to the pursuit of pleasure is a common theme in certain works of dystopian science fiction, such as Brave New World or Fahrenheit 451.However, it could be argued that a culture of self obsession leads to more self-reflection, since, in the quest for the ideal life, individuals will constantly analyze their characters, faults, and ambitions. This can be shown in the trend to seek psychotherapy as the panacea to one's emotional woes. The current popularity of the Humanities among the academic disciplines also shows an increased public interest in humanity and its place in the cosmos.Spiritual movements that encourage the reflective arts of prayer and meditation as a practice are on the rise, both as branches of existing religions and as part of more eclectic movements like the New Age.Art, music, and literature For more details on this topic, see Art, Music,and Literature.Artistic works have existed for almost as long as humankind, from early pre-historic art to contemporary art. Art is one of the most unusual aspects of human behavior and a key distinguishing feature of humans from other species.As a form of cultural expression by humans, art may be defined by the pursuit of diversity and the usage of narratives of liberation and exploration (that is, art history, art criticism, and art theory) to mediate its boundaries. This distinction may be applied to objects or performances, current or historical, and its prestige extends to those who made, found, exhibit, or own them.In the modern use of the word, art is commonly understood to be the process or result of making material works which, from concept to creation, adhere to the "creative impulse" of human beings. Art is distinguished from other works by being in large part unprompted by necessity, by biological drive, or by any undisciplined pursuit of recreation.Music is a natural intuitive phenomenon based on the three distinct and interrelated organization structures of rhythm, harmony, and melody. Listening to music is perhaps the most common and universal form of entertainment for humans, while learning and understanding it are popular disciplines. There are a wide variety of music genres and ethnic musics.Literature, the body of writtenand possibly oralworks, especially creative ones, includes prose, poetry, and drama, both fiction and non-fiction. Literature includes such genres as epic, legend, myth, ballad, and folklore.Spirituality and religionFor more details on this topic, see Spiritualityand Religion.Spirituality, belief or involvement in matters of the soul or spirit, is one of the many different approaches humans take in trying to answer fundamental questions about humankind's place in the universe, the meaning of life, and the ideal way to live one's life. Though these topics have also been addressed by philosophy, and to some extent by science, spirituality is unique in that it focuses on mystical or supernatural concepts such as karma and God. A more organized, but related, concept is religionsometimes used interchangeably with "faith"which is commonly defined as a belief system concerning the supernatural, sacred, or divine, and the moral codes, practices, values, institutions and rituals associated with such belief. In the course of its development, religion has taken on many forms that vary by culture and individual perspective.Some of the chief questions and issues religions are concerned with include life after death (commonly involving belief in an afterlife), the origin of life (the source of a variety of origin beliefs), the nature of the universe (religious cosmology) and its ultimate fate (eschatology), and what is moral or immoral. A common source in religions for answers to these questions are transcendent divine beings such as deities or a singular God, although not all religions are theisticmany are nontheistic or ambiguous on the topic, particularly among the Eastern religions.Although a majority of humans profess some variety of spiritual or religious belief, some are irreligious, lacking or rejecting belief in the supernatural or spiritual. Additionally, although most religions and spiritual beliefs are clearly distinct from science on both a philosophical and methodological level, the two are not generally considered to be mutually exclusive; a majority of humans hold a mix of both scientific and religious views. The distinction between philosophy and religion, on the other hand, is at times less clear, and the two are linked in such fields as the philosophy of religion and theology.Philosophy and self-reflectionFor more details on this topic, see Philosophyand Human nature.Philosophy is a discipline or field of study involving the investigation, analysis, and development of ideas at a general, abstract, or fundamental level. It is the discipline searching for a general understanding of values and reality by chiefly speculative means.The core philosophical disciplines are logic, ontology or metaphysics, epistemology, and axiology, which includes the branches of ethics and aesthetics. Philosophy covers a very wide range of approaches, and is also used to refer to a worldview, to a perspective on an issue, or to the positions argued for by a particular philosopher or school of philosophy. Plato and Aristotle in a detail from The School of Athens by Raphael.Metaphysics is a branch of philosophy concerned with the study of first principles, being, and existence (ontology). In between the doctrines of religion and science, stands the philosophical perspective of metaphysical cosmology. This ancient field of study seeks to draw logical conclusions about the nature of the universe, humanity, God, and/or their connections based on the extension of some set of presumed facts borrowed from religion and/or observation.Humans generally view themselves as the dominant species on Earth, and the most advanced in intelligence and ability to manage their environment. Alongside such claims of dominance is often found radical pessimism because of the frailty and brevity of human life.Humanism is a philosophy that defines a socio-political doctrine the bounds of which are not constrained by those of locally developed cultures, but which seeks to include all of humanity and all issues common to human beings. Because spiritual beliefs of a community often manifests as religious doctrine, the history of which is as factious as it is unitive, secular humanism grew as a response to the need for a common philosophy that transcended the cultural boundaries of local moral codes and religions. Humanism depends chiefly on reason and logic without consideration for the supernatural. Many humanists are religious, however, and see humanism as simply an expression of a common truth present in most religions. Humanists affirm the possibility of an objective truth and accept that human perception of that truth is imperfect. The most basic tenets of humanism are that humans matter and can solve human problems, and that science, freedom of speech, rational thought, democracy, and freedom in the arts are worthy pursuits or goals for all peoples.Science and technology In the mid- to late twentieth century, humans achieved a level of technological mastery sufficient to leave the atmosphere of Earth for the first time, explore space and walk on the moon.For more details on this topic, see Scienceand Technology.Science is the discovery of knowledge about the world by verifiable means. Technology is the objects humans make to serve their purposes.Human cultures are both characterized and differentiated by the objects that they make and use. Archeology attempts to tell the story of past or lost cultures in part by close examination of the artifacts they produced. Early humans left stone tools, pottery, and jewelry that are particular to various regions and times.Improvements in technology are passed from one culture to another. For instance, the cultivation of crops arose in several different locations, but quickly spread to be an almost ubiquitous feature of human life. Similarly, advances in weapons, architecture, and metallurgy are quickly disseminated. Space science provides a new perspective on human significanceSuch techniques can be passed on by oral tradition. The development of writing, itself a kind of technology, made it possible to pass information from generation to generation and from region to region with greater accuracy.Together, these developments made possible the advance of civilization and urbanization, with their inherently complex social arrangements. Eventually, this led to the institutionalization of the development of new technology, and the associated understanding of the way the world functions. This science now forms a central part of human culture.In recent times, physics and astrophysics have come to play a central role in shaping what is now known as physical cosmology, that is, the understanding of the universe through scientific observation and experiment. This discipline, which focuses on the universe as it exists on the largest scales and at the earliest times, begins by arguing for the big bang, a sort of cosmic expansion from which the universe itself is said to have erupted ~13.7 0.2 billion (109) years ago. After its violent beginnings and until its very end, scientists then propose that the entire history of the universe has been an orderly progression governed by physical laws.SocietyFor more details on this topic, see Society.Society is the system of organizations and institutions arising from interaction between humans.Government and politics For more details on this topic, see Government, Politics,and State.A state is an organized political community occupying a definite territory, having an organized government, and possessing internal and external sovereignty. Recognition of the state's claim to independence by other states, enabling it to enter into international agreements, is often important to the establishment of its statehood. The "state" can also be defined in terms of domestic conditions, specifically, as conceptualized by Max Weber, "a state is a human community that (successfully) claims the monopoly of the 'legitimate' use of physical force within a given territory" (Weber 1918). Government can be defined as the political means of creating and enforcing laws, typically via a bureaucratic hierarchy.Politics is the process by which decisions are made within groups. Although the term is generally applied to behavior within governments, politics is also observed in all human group interactions, including corporate, academic, and religious institutions. Many different political systems exist, as do many different ways of understanding them, and many definitions overlap. The most common form of government worldwide is a republic, however other examples include monarchy, social democracy, military dictatorship, and theocracy.All of these issues have a direct relationship with economics. WarFor more details on this topic, see War.War is a state of widespread conflict between states, organizations, or relatively large groups of people, which is characterized by the use of lethal violence between combatants or upon civilians. It is estimated that during the twentieth century between 167 and 188 million humans died as a result of war (Ferguson 2006). A common perception of war is a series of military campaigns between at least two opposing sides involving a dispute over sovereignty, territory, resources, religion or other issues. A war said to liberate an occupied country is sometimes characterized as a "war of liberation," while a war between internal elements of a state is a civil war. Full scale pitched-battle wars between adversaries of comparable strength appear to have nearly disappeared from human activity, with the last major one in the Congo region winding down in the late 1990s. Nearly all war now is asymmetric warfare, in which campaigns of sabotage, guerrilla warfare, and sometimes acts of terrorism disrupt control and supply of better-equipped forces, resulting in long, low-intensity wars of attrition.There have been a wide variety of rapidly advancing tactics throughout the history of war, ranging from conventional war to asymmetric warfare to total war and unconventional warfare. Techniques include hand to hand combat, the use of ranged weapons, and ethnic cleansing. Military intelligence has often played a key role in determining victory and defeat. Propaganda, which often includes factual information, slanted opinion, and disinformation, plays a key role in maintaining unity within a warring group, and/or sowing discord among opponents. In modern warfare, soldiers and armored fighting vehicles are used to control the land, warships the sea, and air power the sky. Outer space has recently become a factor in warfare as well, although no actual warfare is currently carried out in space. War is a strong catalyst in technology. Throughout history there has been a constant struggle between defense and offense, armor, and the weapons designed to breach it. Modern examples include the bunker buster bomb, and the bunkers which they are designed to destroy. Important inventions such as medicine, navigation, metallurgy, mass production, nuclear power, rocketry, and computers have been completely or partially driven by war.Trade and economics Buyers and sellers bargain in Chichicastenango Market, Guatemala.Trade is the voluntary exchange of goods, services, or both, and a form of economics. A mechanism that allows trade is called a market. The original form of trade was barter, the direct exchange of goods and services. Modern traders instead generally negotiate through a medium of exchange, such as money. As a result, buying can be separated from selling, or earning. The invention of money (and later credit, paper money, and non-physical money) greatly simplified and promoted trade.Trade exists for many reasons. Because of specialization and division of labor, most people concentrate on a small aspect of manufacturing or service, trading their labor for products. Trade exists between regions because different regions have an absolute or comparative advantage in the production of some tradeable commodity, or because different regions' size allows for the benefits of mass production. Economics is a social science that studies the production, distribution, trade, and consumption of goods and services.Economics, which focuses on measurable variables, is broadly divided into two main branches: microeconomics, which deals with individual agents, such as households and businesses, and macroeconomics, which considers the economy as a whole, in which case it considers aggregate supply and demand for money, capital, and commodities. Aspects receiving particular attention in economics are resource allocation, production, distribution, trade, and competition. Economic logic is increasingly applied to any problem that involves choice under scarcity or determining economic value. Mainstream economics focuses on how prices reflect supply and demand, and uses equations to predict consequences of decisions.ReferencesISBN links support NWE through referral feesAstner, S. and R. R. Anderson. 2004. Skin phototypes 2003. Journal of Investigative Dermatology 122. Retrieved July 13, 2020.Banton, M. 1977. The Idea of Race. Boulder, CO: Westview Press. ISBN 0891587195.Benthall, J. 2007. Animal liberation and rights. Anthropology Today 23(2): 1-3.Block, 1995. On a confusion about a function of consciousness. Behavioral and Brain Sciences 18(2): 227-287.Boyd, R., and J. B. Silk. 2003. How Humans Evolved. New York: Norton & Company. ISBN 0393978540.Buss, D. M. 2003. The Evolution of Desire: Strategies of Human Mating. New York: Basic Books. ISBN 046500802X.Chimpanzee Sequencing and Analysis Consortium. 2005. Initial sequence of the chimpanzee genome and comparison with the human genome. Nature 437: 6987.Correia, H., S. Balseiro, and M. De Areia. 2005. Sexual dimorphism in the human pelvis: Testing a new hypothesis Homo 56(2): 153-160. Retrieved July 13, 2020.Coveney, D. 2001. Researchers home in on how brain handles abstract thought. Massachusetts Institute of Technology. Retrieved July 13, 2020.de Beer, H. 2004. Observations on the history of Dutch physical stature from the late-Middle Ages to the present Econ Hum Biol 2(1): 45-55. Retrieved July 13, 2020.Dennett, D. 1991. Consciousness Explained. Little Brown & Co. ISBN 0316180653.Disotell, T. R. 1999. Human evolution: Origins of modern humans still look recent Current Biology 9(17): R647-R650. Retrieved July 13, 2020.Dobzhansky, T. 1963. Anthropology and the natural sciences: The problem of human evolution. Current Anthropology 4(2): 138-148.Ebersberger, I., D. Metzler, C. Schwarz, and S. Paabo. 2002. Genomewide comparison of DNA sequences between humans and chimpanzees. American Journal of Human Genetics 70: 149097.Ferguson, N. 2006. The next war of the world. Foreign Affairs Sep/Oct 2006. Retrieved July 13, 2020.Goodman, M., D. Tagle, D. Fitch, W. Bailey, J. Czelusniak, B. Koop, P. Benson, and J. Slightom. 1990. Primate evolution at the DNA level and a classification of hominoids J Mol Evol 30(3): 260 -266. Retrieved July 13, 2020.Harding, R. M., E. Healy, A. J. Ray, N. S. Ellis, N. Flanagan, C. Todd, C. Dixon, A. Sajantila, I. J. Jackson, M. A. Birch-Machin, and J. L. Rees. 2000. Evidence for variable selective pressures at MC1R. American Journal of Human Genetics 66: 13511361.Jablonski, N. G., and G. Chaplin. 2000. The evolution of human skin coloration. Journal of Human Evolution 39: 57-106. Retrieved July 13, 2020.Keita, S. O. Y., R. A. Kittles, C. D. M. Royal, G. E. Bonney, P. Furbert-Harris, G. M. Dunston, and C. N. Rotimi. 2004. Conceptualizing human variation. Nature Genetics 36: S17 - S20. Retrieved July 13, 2020.Khor, G. 2003. Update on the prevalence of malnutrition among children in Asia Nepal Med Coll J 5(2): 113-122. Retrieved July 13, 2020.LaVelle, M. 1995. Natural selection and developmental sexual variation in the human pelvis Am J Phys Anthropol 98(1): 59-72. Retrieved July 13, 2020.Lewontin, R. D. 1973. The apportionment of human diversity. Evolutionary Biology 6: 381-397.Liu, G., NISC Comparative Sequencing Program, S. Zhao, J. A. Bailey, S. C. Sahinalp, C. Alkan, E. Tuzun, E. D. Green, and E. E. Eichler. 2003. Analysis of primate genomic variation reveals a repeat-driven expansion of the human genome. Genome Research 13: 35868.Mayr, E. 2001. What Evolution Is. New York: Basic Books. ISBN 0465044263.Murray, C., and A. Lopez. 1997. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease Study Lancet 349(9063): 1436-1442. Retrievevd July 13, 2020.Nielsen, R., C. Bustamante, A. G. Clark, S. Glanowski, T. B. Sackton, M. J. Hubisz, A. Fiedel-Alon, D. M. Tanenbaum, D. Civello, T. J. White, J. J. Sninsky, M. D. Adams, and M. Cargill. 2005. A scan for positively selected genes in the genomes of humans and chimpanzees. PLoS Biology 3(6): e170.O'Campo, P. 2001. Race. In C. Blakemore and S. Jennett, The Oxford Companion to the Body. New York: Oxford University Press. ISBN 019852403X.Palmer, J. 2006. Consciousness and the symbolic universe. The University of Louisiana at Monroe. Retrieved July 13, 2020.Physorg. 2005. Scientists narrow time limits for human, chimp split. Physorg.com. Retrieved July 13, 2020.Plotnik, J. M., F. B. de Waal, and D. Reiss. 2006. Self-recognition in an Asian elephant. Proc Natl Acad Sci U S A 103(45): 17053-17057. Retrieved July 13, 2020.Public Broadcasting Service (PBS). 2005. The secret life of the brain: 3-D brain anatomy. Public Broadcasting Service. Retrieved July 13, 2020.Risch, N., E. Burchard, E. Ziv, and H. Tang. 2002. Categorization of humans in biomedical research: Genes, race and disease. Genome Biol 3. Retrieved July 13, 2020.Robins, A. 1991. Biological Perspectives on Human Pigmentation. Cambridge: Cambridge University Press. ISBN 0521365147.Rogers, A. R., D. Iltis, and S. Wooding. 2004. Genetic variation at the MC1R locus and the time since loss of human body hair. Current Anthropology 45(1): 105-108.Ruse, M., and J. Travis (eds.). 2009. Evolution: The First Four Billion Years. Belknap Press. ISBN 978-0674031753Rush, D. 2000. Nutrition and maternal mortality in the developing world Am J Clin Nutr 72(1 Suppl): S212-S240. Retrieved July 13, 2020.Sagan, C. 1978. The Dragons of Eden. Ballantine. ISBN 0345346297.Schwartz, M., and J. Vissing. 2002. Paternal inheritance of Mitochondrial DNA. N Engl J Med 347: 576-580.Smedley, A. 1999. Race in North America: Origin and Evolution of a Worldview, 2nd ed. Boulder CO: Westview Press, Boulder. ISBN 0813334489.Stepler, R. 2016. Worlds centenarian population projected to grow eightfold by 2050 Pew Research Center. Retrieved July 13, 2020.Thornhill, R., and C. T. Palmer. 2000. A Natural History of Rape. Biological Bases of Sexual Coercion. Cambridge: MIT Press. ISBN 0585082006.VandenBos, G. R. (ed.). 2007. APA Dictionary of Psychology. Washington, DC: American Psychological Association. ISBN 978-1591473800.Wade, N. 2003. Why humans and their fur parted ways. New York Times August 19, 2003. Retrieved July 13, 2020.Weber, M. 1918. Politics as a vocation. Retrieved July 13, 2020.Wells, J. 2000. Icons of Evolution. Washington, DC: Regnery Publishing. ISBN 0895262762.Wildman, D. E., M. Uddin, G. Liu, L. I. Grossman, and M. Goodman. 2003. Implications of natural selection in shaping 99.4 percent nonsynonymous DNA identity between humans and chimpanzees: Enlarging genus Homo. Proceedings of the National Academy of Sciences 100: 718188.Wood, T. C. 2006. The chimpanzee genome and the problem of biological similarity. Occasional Papers of the BSG 7: 118. Retrieved July 13, 2020. Health & Medicine Genetics & Evolution What does "Homo sapiens" mean? Why are Homo sapiens classified as hominins? What are some physical characteristics of Homo sapiens? When did Homo sapiens first appear on Earth? How do Homo sapiens differ from other hominins? What is the significance of Homo sapiens in evolutionary history? How have Homo sapiens evolved over time? What tools and technologies did early Homo sapiens develop? Homo sapiens, the species to which all modern human beings belong. Homo sapiens is one of several species grouped into the genus Homo, but it is the only one that is not extinct. See also human evolution.The name Homo sapiens was applied in 1758 by the father of modern biological classification (see taxonomy), Carolus Linnaeus. It had long been known that human beings physically resemble the primates more closely than any other known living organisms, but at the time it was a daring act to classify human beings within the same framework used for the rest of nature. Linnaeus, concerned exclusively with similarities in bodily structure, faced only the problem of distinguishing H. sapiens from apes (gorillas, chimpanzees, orangutans, and gibbons), which differ from humans in numerous bodily as well as cognitive features. (Charles Darwins treatise on evolution, On the Origin of Species, would come 101 years later.)(Read Ray KurzweilsBritannica essay on the future of Nonbiological Man.)Since Linnaeuss time, a large fossil record has been discovered. This record contains numerous extinct species that are much more closely related to humans than to todays apes and that were presumably more similar to H. sapiens behaviorally as well. Following the ancestors of modern human beings into the distant past raises the question of what is meant by the word human. H. sapiens is human by definition, whereas apes are not. But what of the extinct members of the human tribe (Hominini), who were clearly not H. sapiens but were nonetheless very much like them? There is no definitive answer to this question. Although human evolution can be said to involve all those species more closely related to H. sapiens than to the apes, the adjective human is usually applied only to H. sapiens and other members of the genus Homo (e.g., H. erectus, H. habilis). Behaviorally, only H. sapiens can be said to be fully human, but even the definition of H. sapiens is a matter of active debate. Some paleoanthropologists extend the span of this species far back into time to include many anatomically distinctive fossils that others prefer to allocate to several different extinct species. In contrast, a majority of paleoanthropologists, wishing to bring the study of hominins into line with that of other mammals, prefer to assign to H. sapiens only those fossil forms that fall within the anatomic spectrum of the species as it exists today. In this sense, H. sapiens is very recent, having originated in Africa more than 315,000 years ago (315 kya).(Read Yuval Noah Hararis Britannica essay on the future of Nonconscious Man.) Before about 1980 it was widely thought that distinctively hominin fossils could be identified from 14 to 12 million years ago (mya). However, during the 1970s geneticists introduced the use of molecular clocks to calculate how long species had been separated from a common ancestor. The molecular clock concept is based on an assumed regularity in the accumulation of tiny changes in the genetic codes of humans and other organisms. Use of this concept, together with a reanalysis of the fossil record, moved the estimated time of the evolutionary split between apes and human ancestors forward to as recently as about 5 mya. Since then the molecular data emerging from DNA sequencing and a steady trickle of new hominin fossil finds have pushed the earliest putative hominin ancestry back in time somewhat, to perhaps 86 mya.

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