

Understanding Evolution conceptual framework

This list of conceptual understandings regarding evolution is aligned across grade levels to help instructors identify age-appropriate learning goals for their students and understand how concepts taught at one grade level lay the groundwork for more sophisticated concepts later on. The conceptual framework is aligned with the 2012 *Framework for K-12 Science Education* and the *Next Generation Science Standards* (NGSS).

In the table below, conceptual alignment is indicated by a code that follows

each aligned concept. For example, LS4.A indicates correspondence to the Life Sciences core idea “Evidence of common ancestry and diversity” from both the NGSS and the *Framework* for that grade level, P3 indicates correspondence to “Planning and carrying out investigations,” the third of eight Science and Engineering Practices listed in those documents, and NOS2 indicates correspondence to the second concept outlined in NGSS’s appendix on the nature of science, “Scientific knowledge is based on empirical evidence.”

History of life				
K-2	3-5	6-8	9-12	13-16
<p>Life has been on Earth a long time.</p> <p>Life forms have changed over time.</p>	<p>Life has been on Earth for billions of years.</p> <p>Life forms have changed over time. (LS4.A)</p> <p>Many forms of life in the past were different from living things today. (LS4.A)</p> <p>Many forms of life in the past were similar to present-day living things. (LS4.A)</p>	<p>Biological evolution accounts for diversity over long periods of time.</p> <p>Through billions of years of evolution, life forms have continued to diversify in a branching pattern, from single-celled ancestors to the diversity of life on Earth today.</p> <p>Life forms of the past were in some ways very different from living forms of today, but in other ways very similar. (LS4.A)</p>	<p>Biological evolution accounts for diversity over long periods of time. (LS4.A, LS4.D)</p> <p>Through billions of years of evolution, life forms have continued to diversify in a branching pattern, from single-celled ancestors to the diversity of life on Earth today.</p> <p>Life forms of the past were in some ways very different from living forms of today, but in other ways very similar. (LS4.A)</p>	<p>Biological evolution accounts for diversity over long periods of time.</p> <p>Through billions of years of evolution, life forms have continued to diversify in a branching pattern, from single-celled ancestors to the diversity of life on Earth today.</p> <p>Life forms of the past were in some ways very different from living forms of today, but in other ways very similar.</p> <p>Evolution is still continuing today.</p> <p>Humans directly impact biodiversity, which may then impact future evolutionary potential.</p>
	<p>Present-day life forms are related to past life forms. (LS4.A)</p>	<p>Present-day life forms are descended from past life forms; all life is related. (LS4.A)</p>	<p>Present-day species evolved from earlier species; the relatedness of organisms is the result of common ancestry. (LS4.A)</p> <p>Life on Earth 3.8 billion years ago consisted of one-celled organisms similar to present-day bacteria.</p> <p>There is evidence of eukaryotes in the fossil record from about one billion years ago; some were the precursors of multicellular organisms.</p> <p>The early evolutionary process of eukaryotes included the merging of prokaryote cells.</p>	<p>Present-day species evolved from earlier species; the relatedness of organisms is the result of common ancestry.</p> <p>Life on Earth 3.8 billion years ago consisted of one-celled organisms similar to present-day bacteria.</p> <p>There is evidence of eukaryotes in the fossil record from about one billion years ago; some were the precursors of multicellular organisms.</p> <p>The early evolutionary process of eukaryotes included the merging of prokaryote cells.</p>

History of life (cont.)

K-2	3-5	6-8	9-12	13-16
		<p>Geological change and biological evolution are linked.</p> <p>Tectonic plate movement has affected the distribution and evolution of living things. (ESS1.C)</p> <p>Living things have had a major influence on the composition of the atmosphere and on the surface of the planet.</p>	<p>Geological change and biological evolution are linked.</p> <p>Tectonic plate movement has affected the distribution and evolution of living things. (ESS1.C)</p> <p>Living things have had a major influence on the composition of the atmosphere and on the surface of the planet. (ESS2.E)</p>	<p>Geological change and biological evolution are linked.</p> <p>Tectonic plate movement has affected the distribution and evolution of living things.</p> <p>Living things have had a major influence on the composition of the atmosphere and on the surface of the planet.</p>
<p>Many life forms have gone extinct.</p>	<p>Most species that once lived on Earth have gone extinct. (LS4.A)</p>	<p>Most species that once lived on Earth have gone extinct. (LS4.A)</p> <p>Background extinctions are a normal occurrence.</p> <p>Mass extinctions occur.</p> <p>Extinction can result from environmental change.</p> <p>Extinction can stimulate evolution by opening up resources.</p>	<p>During the course of evolution, only a small percentage of species have survived until today.</p> <p>Background extinctions are a normal occurrence.</p> <p>Rates of extinction vary.</p> <p>Mass extinctions occur.</p> <p>Extinction can result from environmental change.</p> <p>Extinctions may create opportunities for further evolution in other lineages to occur.</p>	<p>During the course of evolution, only a small percentage of species have survived until today.</p> <p>Background extinctions are a normal occurrence.</p> <p>Rates of extinction vary.</p> <p>Mass extinctions occur.</p> <p>Extinction can result from environmental change.</p> <p>Human influence may be causing a modern mass extinction.</p> <p>Extinctions may create opportunities for further evolution in other lineages to occur.</p>
			<p>Rates of evolution vary.</p> <p>Rates of speciation vary.</p> <p>Evolutionary change can sometimes happen rapidly.</p> <p>Some lineages remain relatively unchanged for long periods of time.</p>	<p>Rates of evolution vary.</p> <p>Rates of speciation vary.</p> <p>Evolutionary change can sometimes happen rapidly.</p> <p>Some lineages remain relatively unchanged for long periods of time.</p>

Evidence of evolution

K-2	3-5	6-8	9-12	13-16
Today there are many diverse forms of life. (LS4.D)	Life is very diverse. (LS4.D)	The patterns of life's diversity through time provide evidence of evolution. (LS4.A)	The patterns of life's diversity through time provide evidence of evolution.	The patterns of life's diversity through time provide evidence of evolution.
				Evolution can sometimes be directly observed.
Plants and animals have features that allow them to live in various environments. (LS4.C) Form is linked to function.	There is a fit between organisms and their environments, though not always a perfect fit. (LS4.C) Form is linked to function.	An organism's features reflect its evolutionary history. There is a fit between organisms and their environments, though not always a perfect fit. (LS4.C) There is a fit between the form of a trait and its function, though not always a perfect fit. Some traits of organisms are not adaptive.	An organism's features reflect its evolutionary history. There is a fit between organisms and their environments, though not always a perfect fit. (LS4.C) There is a fit between the form of a trait and its function, though not always a perfect fit. Some traits of organisms are not adaptive. Features sometimes acquire new functions through natural selection.	An organism's features reflect its evolutionary history. There is a fit between organisms and their environments, though not always a perfect fit. There is a fit between the form of a trait and its function, though not always a perfect fit. Some traits of organisms are not adaptive. Features sometimes acquire new functions through natural selection.
Fossils provide evidence of past life.	Fossils provide evidence of past life. (LS4.A)	Fossils provide evidence of past life. (LS4.A) The fossil record contains organisms with transitional features. The sequence of forms in the fossil record is reflected in the sequence of the rock layers in which they are found and indicates the order in which they evolved. (LS4.A)	The fossil record provides evidence for evolution. The fossil record documents the biodiversity of the past. The fossil record contains organisms with transitional features. The fossil record documents patterns of extinction and the appearance of new forms. The sequence of forms in the fossil record is reflected in the sequence of the rock layers in which they are found and indicates the order in which they evolved. Radiometric dating can often be used to determine the age of fossils.	The fossil record provides evidence for evolution. The fossil record documents the biodiversity of the past. The fossil record contains organisms with transitional features. The fossil record documents patterns of extinction and the appearance of new forms. The sequence of forms in the fossil record is reflected in the sequence of the rock layers in which they are found and indicates the order in which they evolved. Radiometric dating can often be used to determine the age of fossils.
Living things are alike in some ways and different in other ways.	There are similarities and differences among fossils and living organisms. (LS4.A)	There are similarities and differences among fossils and living organisms. (LS4.A)	There are similarities and differences among fossils and living organisms.	There are similarities and differences among fossils and living organisms.

Evidence of evolution (cont.)

K-2	3-5	6-8	9-12	13-16
		<p>All life forms share fundamental similarities. (LS4.A)</p> <p>Anatomical similarities of living things reflect common ancestry. (LS4.A)</p> <p>There are similarities in the cell function of all organisms.</p> <p>All life forms use the same basic DNA building blocks.</p> <p>Not all similar traits are homologous; some are the result of convergent evolution.</p>	<p>Similarities among existing organisms provide evidence for evolution. (LS4.A)</p> <p>Anatomical similarities of living things reflect common ancestry. (LS4.A)</p> <p>There are similarities in the cell function of all organisms. (LS4.A)</p> <p>All life forms use the same basic DNA building blocks. (LS4.A)</p> <p>Developmental similarities of living things often reflect their relatedness. (LS4.A)</p> <p>Not all similar traits are homologous; some are the result of convergent evolution.</p>	<p>Similarities among existing organisms (including morphological, developmental, and molecular similarities) reflect common ancestry and provide evidence for evolution.</p> <p>Not all similar traits are homologous; some are the result of convergent evolution.</p>
				<p>The geographic distribution of species often reflects how geologic change has influenced lineage splitting.</p>
	<p>Selective breeding can produce offspring with new traits.</p>	<p>Artificial selection provides a model for natural selection. (LS4.B)</p> <p>People selectively breed domesticated plants and animals to produce offspring with preferred characteristics. (LS4.B)</p>	<p>Artificial selection provides a model for natural selection.</p> <p>People selectively breed domesticated plants and animals to produce offspring with preferred characteristics.</p>	<p>Artificial selection provides a model for natural selection.</p> <p>People selectively breed domesticated plants and animals to produce offspring with preferred characteristics.</p>

Mechanisms of evolution				
K-2	3-5	6-8	9-12	13-16
				<p>Evolution is often defined as a change in allele frequencies within a population.</p> <p>The Hardy-Weinberg equation describes expectations about the gene pool of a population that is not evolving—one that is very large, mates randomly, and does not experience mutation, natural selection, or gene flow.</p>
		<p>Evolution results from natural selection acting upon variation within a population. (LS4.B)</p>	<p>Evolution occurs through multiple mechanisms.</p> <p>Evolution results from selection acting upon genetic variation within a population. (LS4.B)</p> <p>Evolution results from genetic drift acting upon genetic variation within a population.</p>	<p>Evolution occurs through multiple mechanisms.</p> <p>Evolution results from natural selection acting upon genetic variation within a population.</p> <p>Evolution results from genetic drift acting upon genetic variation within a population.</p> <p>Evolution results from mutations.</p> <p>Evolution results from gene flow.</p> <p>Evolution results from hybridization.</p>
<p>There is variation within a population. (LS3.A, LS3.B)</p>	<p>There is variation within a population. (LS3.A, LS3.B)</p>	<p>There is variation within a population. (LS3.B)</p> <p>Variation is the result of genetic recombination or mutation. (LS3.A)</p> <p>The variation that occurs within a population is random.</p>	<p>There is variation within a population. (LS3.B)</p> <p>Natural selection acts on the variation that exists in a population. (LS4.B, LS4.C)</p> <p>Natural selection acts on phenotype as an expression of genotype.</p> <p>The amount of genetic variation within a population may affect the likelihood of survival of the population; the less the available diversity, the less likely the population will be able to survive environmental change.</p>	<p>Natural selection and genetic drift act on the variation that exists in a population.</p> <p>Natural selection acts on phenotype as an expression of genotype.</p> <p>Phenotype is a product of both genotype and the organism's interactions with the environment.</p> <p>Variation of a character within a population may be discrete or continuous.</p> <p>Continuous characters are generally influenced by many different genes.</p>

Mechanisms of evolution (cont.)

K-2	3-5	6-8	9-12	13-16
<p>Living things have offspring. (LS3.A)</p> <p>Offspring inherit many traits from their parents, but are not exactly the same as their parents. (LS3.A)</p> <p>Siblings are similar to, but not identical to, one another.</p>	<p>Offspring inherit many traits from their parents, but are not exactly identical to their parents. (LS3.A, LS3.B)</p>	<p>Offspring inherit many traits from their parents, but are not identical to their parents. (LS3.B)</p>	<p>New heritable traits can result from recombinations of existing genes or from genetic mutations in reproductive cells. (LS3.B)</p> <p>Mutations are random.</p> <p>Organisms cannot intentionally produce adaptive mutations in response to environmental influences.</p> <p>Complex structures may be produced incrementally by the accumulation of smaller useful mutations.</p>	<p>New heritable traits can result from mutations.</p> <p>Mutation is a random process.</p> <p>Organisms cannot intentionally produce adaptive mutations in response to environmental influences.</p> <p>Complex structures may be produced incrementally by the accumulation of smaller advantageous mutations.</p>
	<p>Advantageous features help living things survive. (LS4.B, LS4.C)</p> <p>Depending upon the environment, some living things will survive better than others. (LS4.B, LS4.C)</p> <p>Environmental changes may affect an organism's ability to survive. (LS4.B, LS4.C, LS4.D)</p>	<p>Traits that are advantageous often persist in a population. (LS4.B, LS4.C)</p> <p>Individual organisms with advantageous traits are more likely to survive and have offspring. (LS4.B, LS4.C)</p> <p>The number of offspring that survive to reproduce successfully is limited by environmental factors. (LS4.B, LS4.C)</p> <p>Organisms with similar requirements may compete with one another for limited resources.</p> <p>Environmental changes may provide opportunities that can influence natural selection. (LS4.B, LS4.C)</p>	<p>Inherited characteristics affect the likelihood of an organism's survival and reproduction. (LS4.B, LS4.C)</p> <p>Over time, the proportion of individuals with advantageous characteristics may increase (and the proportion with disadvantageous characteristics may decrease) due to their likelihood of surviving and reproducing. (LS4.B, LS4.C)</p> <p>Populations, not individuals, evolve.</p> <p>Traits that confer an advantage may persist in the population and are called adaptations. (LS4.B, LS4.C)</p> <p>The number of offspring that survive to reproduce successfully is limited by environmental factors. (LS4.B, LS4.C)</p> <p>Depending on environmental conditions, inherited characteristics may be advantageous, neutral, or detrimental.</p> <p>Environmental changes may provide opportunities that can influence natural selection. (LS4.B, LS4.C)</p>	<p>Inherited characteristics affect the likelihood of an organism's survival and reproduction.</p> <p>Over time, the proportion of individuals with advantageous characteristics may increase (and the proportion with disadvantageous characteristics may decrease) due to their likelihood of surviving and reproducing.</p> <p>Traits that confer an advantage may persist in the population and are called adaptations.</p> <p>Complex traits can arise through the cooption of another trait.</p> <p>The number of offspring that survive to reproduce successfully is limited by environmental factors.</p> <p>Depending on environmental conditions, inherited characteristics may be advantageous, neutral, or detrimental.</p>

Mechanisms of evolution (cont.)

K-2	3-5	6-8	9-12	13-16
				<p>Natural selection can act on the variation in a population in different ways.</p> <p>Natural selection may favor individuals with one extreme value for a trait, shifting the average value of that trait in one direction over the course of many generations.</p> <p>Selection favoring an extreme trait value reduces genetic variation in a population.</p> <p>Natural selection may favor individuals with traits at each extreme of the range for that trait.</p> <p>Selection favoring individuals with traits at each extreme of a range maintains genetic variation in a population.</p> <p>Natural selection may favor individuals with an intermediate value for a trait.</p> <p>Selection favoring an intermediate value for a trait reduces genetic variation in a population.</p> <p>Natural selection sometimes favors heterozygotes over homozygotes at a locus.</p> <p>Heterozygote advantage preserves genetic variation at that locus (i.e., within the population, it maintains multiple alleles at that locus).</p> <p>Natural selection sometimes favors rare traits and acts against those that become too common in a population.</p> <p>Frequency-dependent selection preserves genetic variation in a population.</p>

<i>Mechanisms of evolution (cont.)</i>				
K-2	3-5	6-8	9-12	13-16
				<p>Sexual selection occurs when selection acts on characteristics that affect the ability of individuals to obtain mates.</p> <p>Sexual selection can lead to physical and behavioral differences between the sexes.</p>
			<p>Fitness is reproductive success—the number of viable offspring produced by an individual in comparison to other individuals in a population/species.</p> <p>Fitness is often measured using proxies like mass, number of matings, and survival because it is difficult to measure reproductive success directly.</p>	<p>An individual's fitness (or relative fitness) is the contribution that individual makes to the gene pool of the next generation relative to other individuals in the population.</p> <p>An organism's fitness depends on both its survival and its reproduction.</p> <p>Fitness is often measured using proxies like mass, number of matings, and survival because it is difficult to measure reproductive success.</p>
				<p>Natural selection is capable of acting at multiple hierarchical levels: on genes, on cells, on individuals, on populations, on species, and on larger clades.</p>
			<p>Random factors can affect the survival of individuals and of populations.</p>	<p>Random factors can affect the survival of individuals and of populations.</p> <p>Smaller populations are more strongly affected by genetic drift than are larger populations.</p> <p>Genetic drift can cause loss of genetic variation in a population.</p> <p>Founder effects occur when a population is founded from a small number of individuals.</p> <p>Founder effects can affect the genetic makeup of a newly started population (and reduce its genetic variation) through sampling error.</p>

<i>Mechanisms of evolution (cont.)</i>				
K-2	3-5	6-8	9-12	13-16
				<p>Bottlenecks occur when a population's size is greatly reduced.</p> <p>Bottlenecks can affect the genetic makeup of a population (and reduce its genetic variation) through sampling error.</p>
				<p>A species is often defined as a group of individuals that actually or potentially interbreed in nature.</p> <p>There are many definitions of species.</p>
			<p>Speciation is the splitting of one ancestral lineage into two or more descendant lineages.</p> <p>Speciation is often the result of geographic isolation.</p> <p>Speciation requires reproductive isolation.</p> <p>Occupying new environments can provide new selection pressures and new opportunities, leading to speciation. (LS4.C)</p>	<p>Speciation is the splitting of one ancestral lineage into two or more descendant lineages.</p> <p>Speciation is often the result of geographic isolation.</p> <p>Speciation can also occur without geographic isolation.</p> <p>Speciation requires reproductive isolation.</p> <p>Reproductive isolation can occur through mechanisms that prevent fertilization from occurring.</p> <p>Reproductive isolation can also occur through mechanisms that act after fertilization, when a fertilized egg (or the individual resulting from that egg) has low fitness.</p> <p>Occupying new environments can provide new selection pressures and new opportunities, leading to speciation.</p>

<i>Mechanisms of evolution (cont.)</i>				
K-2	3-5	6-8	9-12	13-16
				<p>Occasionally offspring, known as hybrids, result from matings between distinct species or between distinct parental forms.</p> <p>Some hybrids have increased fitness relative to their parents.</p> <p>Some hybrids have decreased fitness relative to their parents.</p>
			Evolution does not consist of progress in any particular direction.	Evolution does not consist of progress in any particular direction.

Nature of science

K-2	3-5	6-8	9-12	13-16
	Science deals with the natural world and natural explanations. (NOS8)	Science focuses on natural phenomena and processes. (NOS8)	Science focuses on natural phenomena and processes.	Science focuses on natural phenomena and processes.
Scientific ideas may change based on what we observe and experience. (NOS3)	Scientific ideas may change with new evidence. (NOS3)	Scientific knowledge is open to question and revision as we come up with new ideas and discover new evidence. (P6, NOS3)	Scientific knowledge is open to question and revision as we come up with new ideas and discover new evidence. (P4, P6, NOS3)	Scientific knowledge is open to question and revision as we come up with new ideas and discover new evidence.
We learn about the natural world using our senses and extensions of our senses. (P3, P4, P6)	Scientists base their ideas on evidence from the natural world. (P3, P6, P7, NOS8)	<p>A hallmark of science is exposing ideas to testing. (P3, P4, P6, P7)</p> <p>Scientists test their ideas using multiple lines of evidence.</p> <p>Scientists use multiple research methods (experiments, observational research, comparative research, and modeling) to collect evidence. (P2, P3, P4, NOS1)</p> <p>Scientists can test ideas about events and processes long past, very distant, and not directly observable.</p>	<p>A hallmark of science is exposing ideas to testing. (P3, P4, P6, P7)</p> <p>Scientists test their ideas using multiple lines of evidence. (P6, NOS2)</p> <p>Scientists use multiple research methods (experiments, observational research, comparative research, and modeling) to collect data. (P2, P3, P4, NOS1)</p> <p>Scientists can test ideas about events and processes long past, very distant, and not directly observable.</p>	<p>A hallmark of science is exposing ideas to testing.</p> <p>Scientists test their ideas using multiple lines of evidence.</p> <p>Scientists use multiple research methods (experiments, observational research, comparative research, and modeling) to collect data.</p> <p>Scientists can test ideas about events and processes long past, very distant, and not directly observable.</p>
			Scientists may explore many different hypotheses to explain their observations. (P7)	Scientists may explore many different hypotheses to explain their observations.
	The real process of science is complex, iterative, and can take many different paths.	The real process of science is complex, iterative, and can take many different paths.	The real process of science is complex, iterative, and can take many different paths.	<p>The real process of science is complex, iterative, and can take many different paths.</p> <p>Scientific findings and evidence inspire new questions and shape the directions of future scientific research.</p>
		Accepted scientific theories are not tenuous; they must survive rigorous testing and be supported by multiple lines of evidence to be accepted. (NOS4)	Accepted scientific theories are not tenuous; they must survive rigorous testing and be supported by multiple lines of evidence to be accepted. (NOS2, NOS4)	Accepted scientific theories are not tenuous; they must survive rigorous testing and be supported by multiple lines of evidence to be accepted.
Science is a human endeavor. (NOS7)	Science is a human endeavor. (NOS7)	Science is a human endeavor. (NOS7)	Science is a human endeavor. (NOS7)	Science is a human endeavor.
			Authentic scientific controversy and debate within the community contribute to scientific progress. (P7)	Authentic scientific controversy and debate within the community contribute to scientific progress.

Studying evolution

K-2	3-5	6-8	9-12	13-16
		Our knowledge of the evolution of living things is always being refined as we gather more evidence.	Our knowledge of the evolution of living things is always being refined as we gather more evidence.	Our knowledge of the evolution of living things is always being refined as we gather more evidence.
<p>Scientists study living things.</p> <p>Scientists study fossils.</p> <p>Scientists study rocks.</p>	<p>Scientists study living things and how they are related.</p> <p>Scientists study fossils and how and when they were formed. (LS4.A)</p> <p>Scientists study rocks and how and when they were formed.</p>	<p>Scientists use multiple lines of evidence to study life over time.</p> <p>Scientists use anatomical features to infer the relatedness of taxa. (LS4.A)</p> <p>Scientists use fossils to learn about past life. (LS4.A, ESS1.C)</p> <p>Scientists use geological evidence to establish the age of fossils.</p> <p>Scientists use artificial selection as a model to learn about natural selection. (P2)</p>	<p>Our understanding of life through time is based upon multiple lines of evidence.</p> <p>Scientists use the similarity of DNA nucleotide sequences to infer the relatedness of taxa. (LS4.A)</p> <p>Scientists use anatomical features to infer the relatedness of taxa. (LS4.A)</p> <p>Scientists use developmental evidence to infer the relatedness of taxa. (LS4.A)</p> <p>Scientists use fossils (including sequences of fossils showing gradual change over time) to learn about past life.</p> <p>Scientists use physical, chemical, and geological evidence to establish the age of fossils.</p> <p>Scientists use the geographic distribution of fossils and living things to learn about the history of life.</p> <p>Scientists use experimental evidence to study evolutionary processes.</p> <p>Scientists use artificial selection as a model to learn about natural selection. (P2)</p>	<p>Our understanding of life through time is based upon multiple lines of evidence.</p> <p>Scientists use multiple lines of evidence (including morphological, developmental, and molecular evidence) to infer the relatedness of taxa.</p> <p>Scientists use fossils (including sequences of fossils showing gradual change over time) to learn about past life.</p> <p>Scientists use physical, chemical, and geological evidence and comparative anatomy to establish the age of fossils.</p> <p>Scientists use the geographic distribution of fossils and living things to learn about the history of life.</p> <p>Scientists use experimental evidence to study evolutionary processes.</p> <p>Scientists use artificial selection as a model to learn about natural selection.</p>

Studying evolution (cont.)

K-2	3-5	6-8	9-12	13-16
		<p>Classification is based on evolutionary relationships.</p> <p>Evolutionary relationships may be represented by branching trees (i.e. phylogenies or cladograms).</p>	<p>Classification is based on evolutionary relationships.</p> <p>Evolutionary trees (i.e., phylogenies or cladograms) portray hypotheses about evolutionary relationships.</p> <p>Evolutionary trees (i.e., phylogenies or cladograms) are built from multiple lines of evidence.</p>	<p>Classification is based on evolutionary relationships.</p> <p>Evolutionary trees (i.e., phylogenies or cladograms) portray hypotheses about evolutionary relationships.</p> <p>Evolutionary trees (i.e., phylogenies or cladograms) are built from multiple lines of evidence.</p> <p>The principle of parsimony suggests that the phylogenetic hypothesis most likely to be true is the one requiring the fewest evolutionary changes.</p> <p>Evolutionary trees can be used to make inferences and predictions.</p>
			<p>As with other scientific disciplines, evolutionary biology has applications that factor into everyday life.</p>	<p>As with other scientific disciplines, evolutionary biology has applications that factor into everyday life, for example in agriculture, biodiversity and conservation biology, and medicine and health.</p> <p>Because of common ancestry, model organisms can be used to provide insight into the biology of other organisms.</p>