

# Taxonomy (general)

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For biological taxonomy, see [Taxonomy \(biology\)](#). For other uses, see [Taxonomy \(disambiguation\)](#).

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**Taxonomy** is the practice and science of classification. The word is also used as a [count noun](#): a **taxonomy**, or **taxonomic scheme**, is a particular [classification](#). The word finds its roots in the [Greek](#) *τάξις*, *taxis* (meaning 'order', 'arrangement') and νόμος, *nomos* ('law' or 'science'). Originally *taxonomy* referred only to the classifying of organisms or a particular classification of organisms.<sup>[1]</sup> In a wider, more general sense, it may refer to a classification of things or concepts, as well as to the principles underlying such a classification. Taxonomy is different from [meronomy](#) which is dealing with the classification of parts of a whole.

Many taxonomies have a [hierarchical](#) structure, but this is not a requirement. Taxonomy uses taxonomic units, known as **taxa** (singular [taxon](#)).

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## Applications

[Wikipedia](#) categories illustrate a taxonomy<sup>[2]</sup> and a full taxonomy of Wikipedia categories can be extracted by automatic means.<sup>[3]</sup> Recently, it has been shown that a manually-constructed taxonomy, such as that of computational lexicons like [WordNet](#), can be used to improve and restructure the Wikipedia category taxonomy.<sup>[4]</sup>

In an even wider sense, the term taxonomy could also be applied to relationship schemes other than parent-child hierarchies, such as [network structures](#) with other types of relationships. Taxonomies may then include single children with multi-parents, for example, "Car" might appear with both parents "Vehicle" and "Steel Mechanisms"; to some however, this merely means that 'car' is a part of several different taxonomies.<sup>[5]</sup> A taxonomy might also be a simple organization of kinds of things into groups, or even an alphabetical list. However, the term vocabulary is more appropriate for such a list. In current usage within [Knowledge Management](#), taxonomies are considered narrower than [ontologies](#) since ontologies apply a larger variety of relation types.<sup>[6]</sup>

Mathematically, a hierarchical taxonomy is a [tree structure](#) of classifications for a given set of objects. It is also named [Containment hierarchy](#). At the top of this structure is a single classification, the root node, that applies to all objects. Nodes below this root are more

specific classifications that apply to subsets of the total set of classified objects. The progress of reasoning proceeds from the general to the more specific.

By contrast, in the context of legal terminology, an open-ended contextual taxonomy is employed—a taxonomy holding only with respect to a specific context. In scenarios taken from the legal domain, a formal account of the open-texture of legal terms is modeled, which suggests varying notions of the "core" and "penumbra" of the meanings of a concept. The progress of reasoning proceeds from the specific to the more general.<sup>[7]</sup>

## History

[Anthropologists](#) have observed that taxonomies are generally embedded in local cultural and social systems, and serve various social functions. Perhaps the most well-known and influential study of [folk taxonomies](#) is [Émile Durkheim](#)'s *The Elementary Forms of Religious Life*. A more recent treatment of folk taxonomies (including the results of several decades of empirical research) and the discussion of their relation to the scientific taxonomy can be found in Scott Atran's *Cognitive Foundations of Natural History*. Folk taxonomies of organisms have been found in large part to agree with scientific classification, at least for the larger and more obvious species, which means that it is not the case that folk taxonomies are based purely on utilitarian characteristics.<sup>[8]</sup>

In the seventeenth century the German mathematician and philosopher [Gottfried Leibniz](#), following the work of the thirteenth-century Majorcan philosopher [Ramon Llull](#) on his *Ars generalis ultima*, a system for procedurally generating concepts by combining a fixed set of ideas, sought to develop an [alphabet of human thought](#). Leibniz intended his *characteristica universalis* to be an "algebra" capable of expressing all conceptual thought. The concept of creating such a "[universal language](#)" was frequently examined in the seventeenth century, also notably by the English philosopher [John Wilkins](#) in his work *An Essay towards a Real Character and a Philosophical Language* (1668), from which the classification scheme in [Roget's Thesaurus](#) ultimately derives.

## Is-a and has-a relationships

 This section requires [expansion](#). (April 2013)

Two of the predominant types of relationships in [knowledge-representation](#) systems are [predication](#) and the universally quantified [conditional](#). Predication relationships express the notion that an individual entity is an example of a certain type (for example, *John is a bachelor*), while universally quantified conditionals express the notion that a type is a subtype of another type (for example, *A dog is a mammal*, which means the same as *All dogs are mammals*).<sup>[9]</sup>