

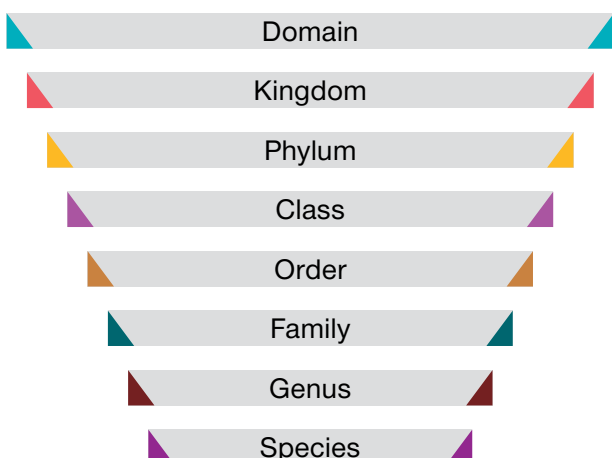
Educator guide

CLASSIFICATION OVERVIEW

This resource is one of three that details geological time and fossilisation, as well as a brief overview of the history and evolution of life on Earth.

This resource introduces students to the simplest forms of life, *Cyanobacteria*, up to complex life like *Homo sapiens*, us! Each poster contains the organism's taxonomy – a biological classification

system that uses a hierarchy of names (Padial *et al.*, 2010). A species scientific name is written in Latin, and follows 'binomial nomenclature', meaning two names, e.g. a wolf has the scientific name *Canis lupus*, a combination of the genus *Canis* and species *lupus*. The posters in this series all include an organism's Domain, and Kingdom classification.



DOMAIN

Eukaryota
All plants, animals, and fungi.

Archaea
Single celled extremophile organisms.

Bacteria
Single celled organisms that were among the first life forms to evolve.

KINGDOM

Animalia
All animals

Plantae
All plants

Fungi
All fungi

Phylum, Class, Order, Family, Genus, and Species then become more and more granular, classifying organisms by similarities of biological complexity, relatedness, reproductive similarity, and genetics. It is worth mentioning that the field of taxonomy and classification is ever-evolving, which makes classification sometimes difficult (Franz 2010). Taxonomic classification is also sometimes at odds with an organism's evolutionary history, or its phylogeny (Sigwart *et al.*, 2018).

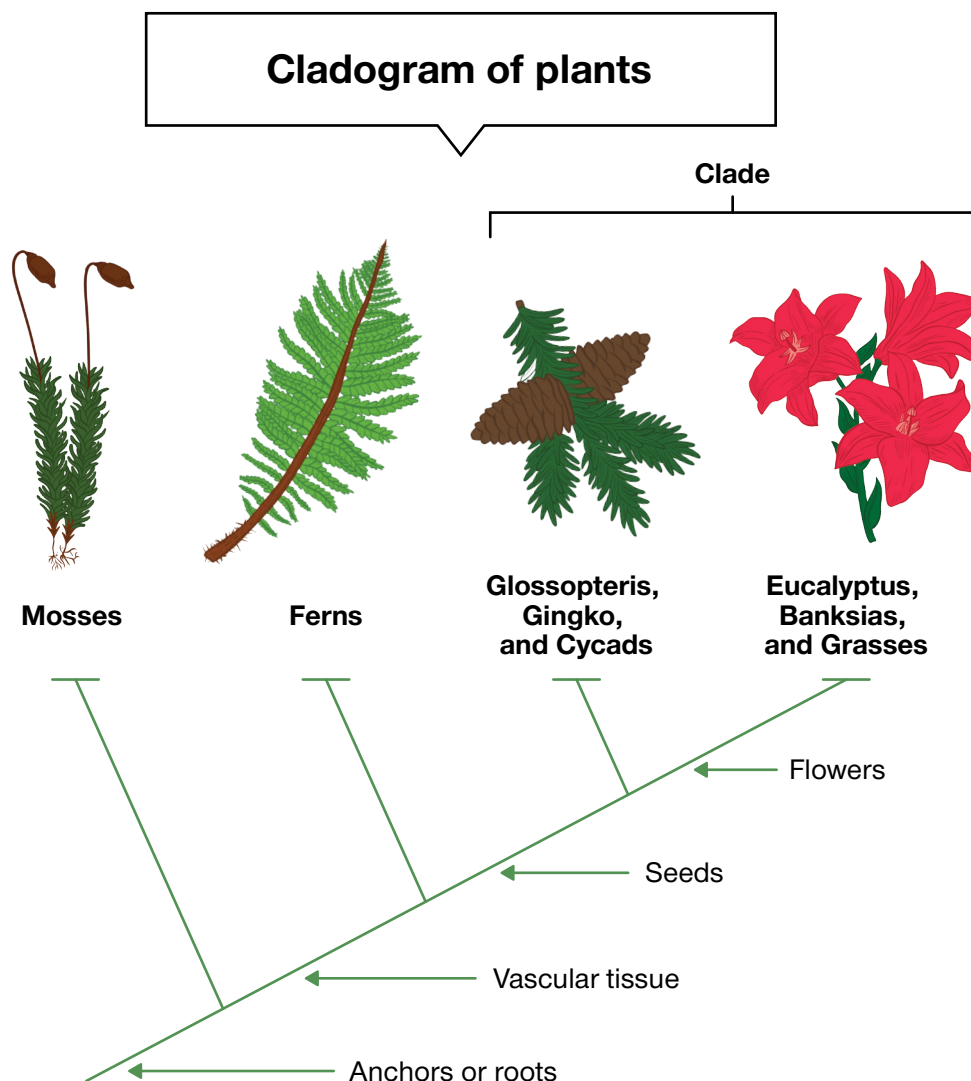
The higher up the taxonomic classification, the broader the category. The table below compares a few common arthropods to see their relationships at different classification levels. This demonstrates the importance of the full hierarchical classification system.

	Trilobite	Horseshoe crab	Redback spider	Christmas beetle	Blue Banded Bee	Southern rock lobster	Blue swimmer crab
Domain	Eukaryota	Eukaryota	Eukaryota	Eukaryota	Eukaryota	Eukaryota	Eukaryota
Kingdom	Animalia	Animalia	Animalia	Animalia	Animalia	Animalia	Animalia
Phylum	Arthropoda	Arthropoda	Arthropoda	Arthropoda	Arthropoda	Arthropoda	Arthropoda
Subphylum	x	Chelicerata	Chelicerata	x	x	x	x
Class	Trilobita		Arachnida	Insecta	Insecta	Malacostraca	Malacostraca
Order	x	Xiphosura	Araneae	Coleoptera	Hymenoptera	Decapoda	Decapoda
Family	x	Limulidae	Theridiidae	Scarabaeidae	Apidae	Palinuridae	Portunidae
Genus	x	x	<i>Latrodectus</i>	<i>Anoplognathus</i>	<i>Amegilla</i>	<i>Jasus</i>	<i>Portunus</i>
Species	x	x	<i>L. hasselti</i>	x	<i>A. cingulata</i>	<i>J. edwardsii</i>	<i>P. pelagicus</i>

The coloured triangles represent the taxonomic classifications that are in common across each species in the table. Insecta and Malacostraca are differentiated within 'Class', through a fully coloured triangle (Insecta), and an outlined triangle (Malacostraca).

You will see the word 'clade' a few times in the taxonomic classification of some organisms. A clade is a more informal grouping of organisms that is not strictly tied to taxonomy. Clades include a common ancestor species, and all

descendant species (De Queiroz 2007). For example, the clades *angiospermae* and *gymnospermae* all contain vascular plants that bear seeds, yet *angiosperms* are flowering plants, and *gymnosperms* are non-flowering plants.



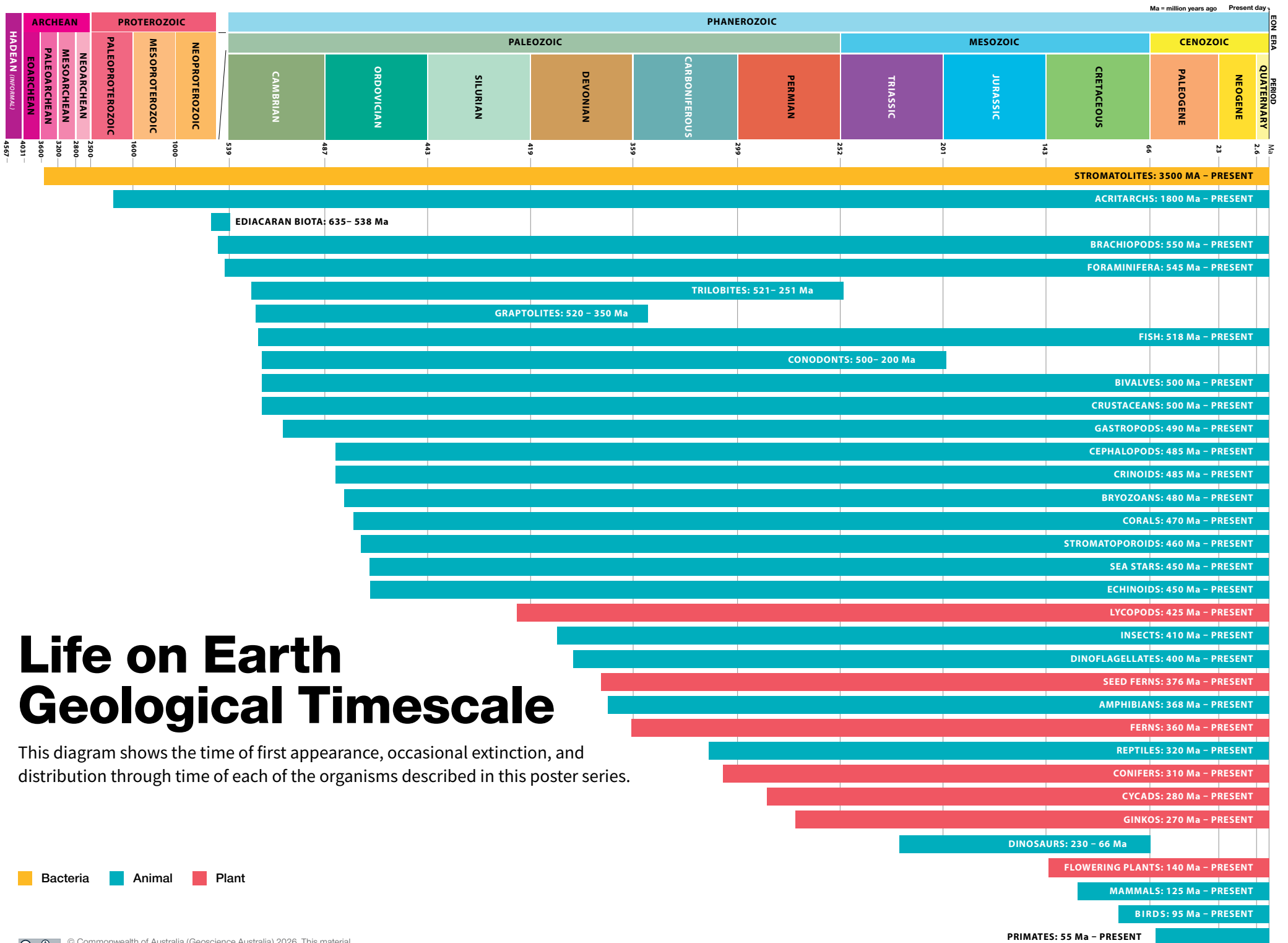
References

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Life on Earth Geological Timescale

This diagram shows the time of first appearance, occasional extinction, and distribution through time of each of the organisms described in this poster series.