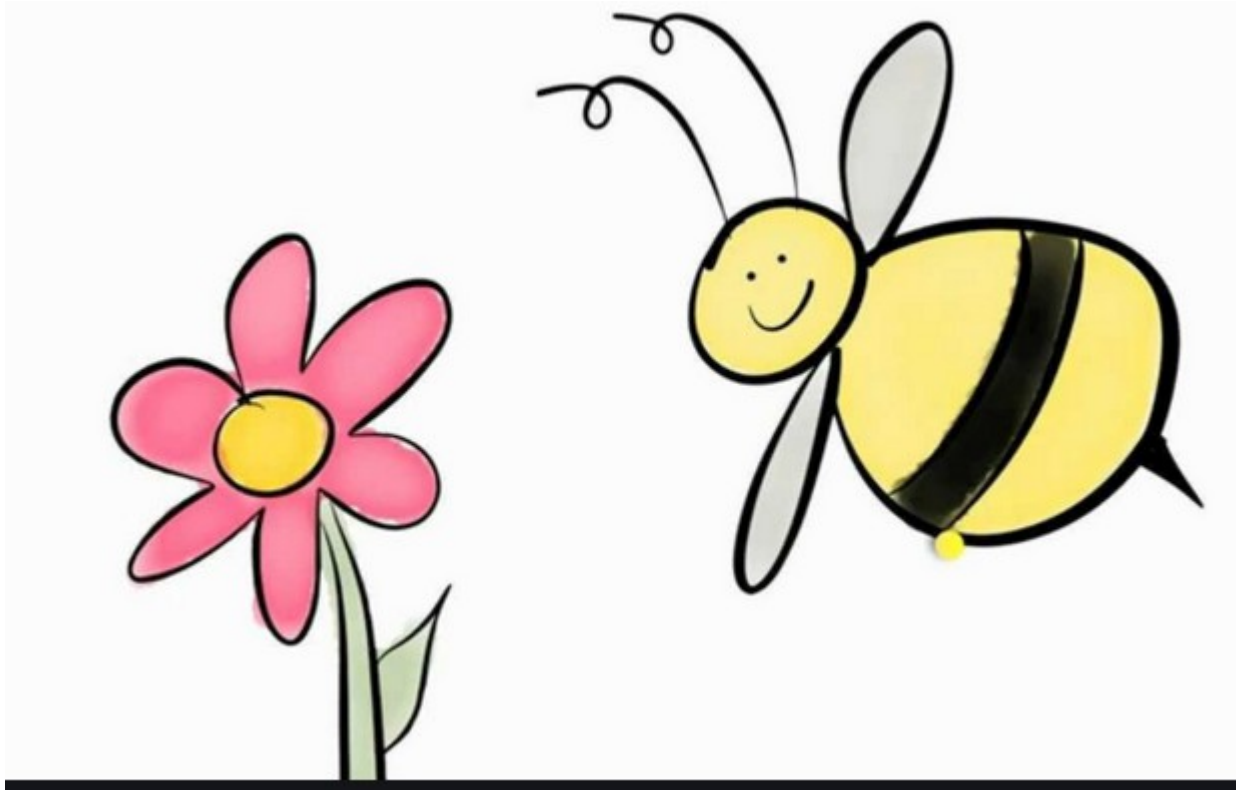
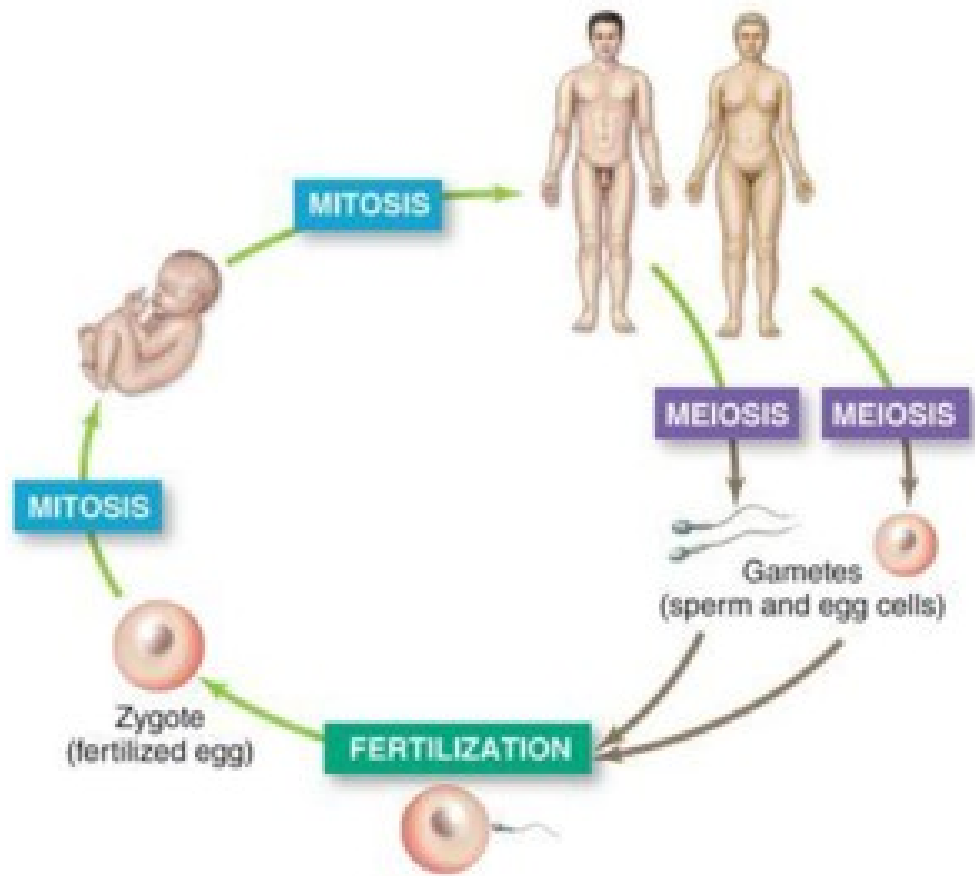


CORSO DI BOTANICA SISTEMATICA

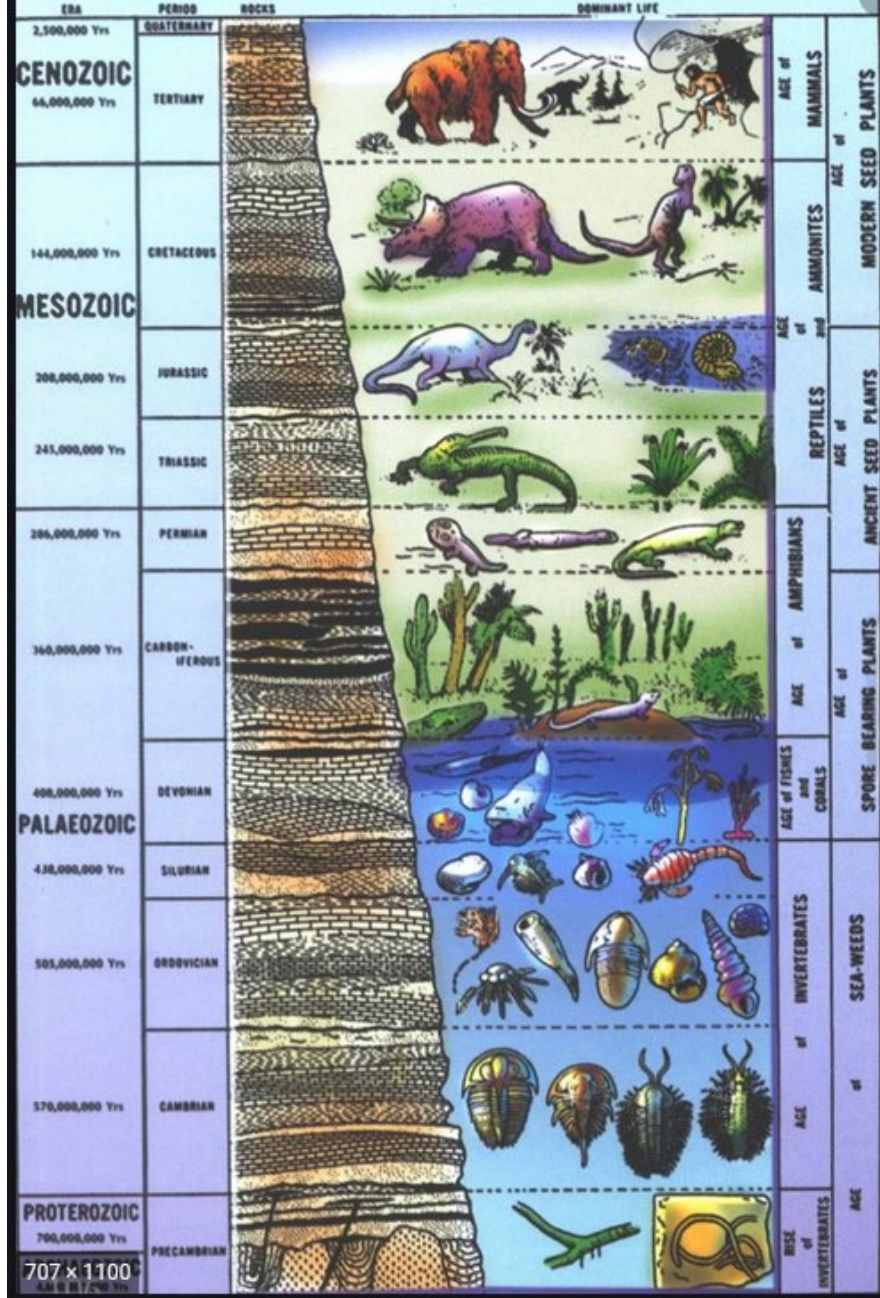
LEZIONE 5

**Evoluzione dei cicli
metagenetici**

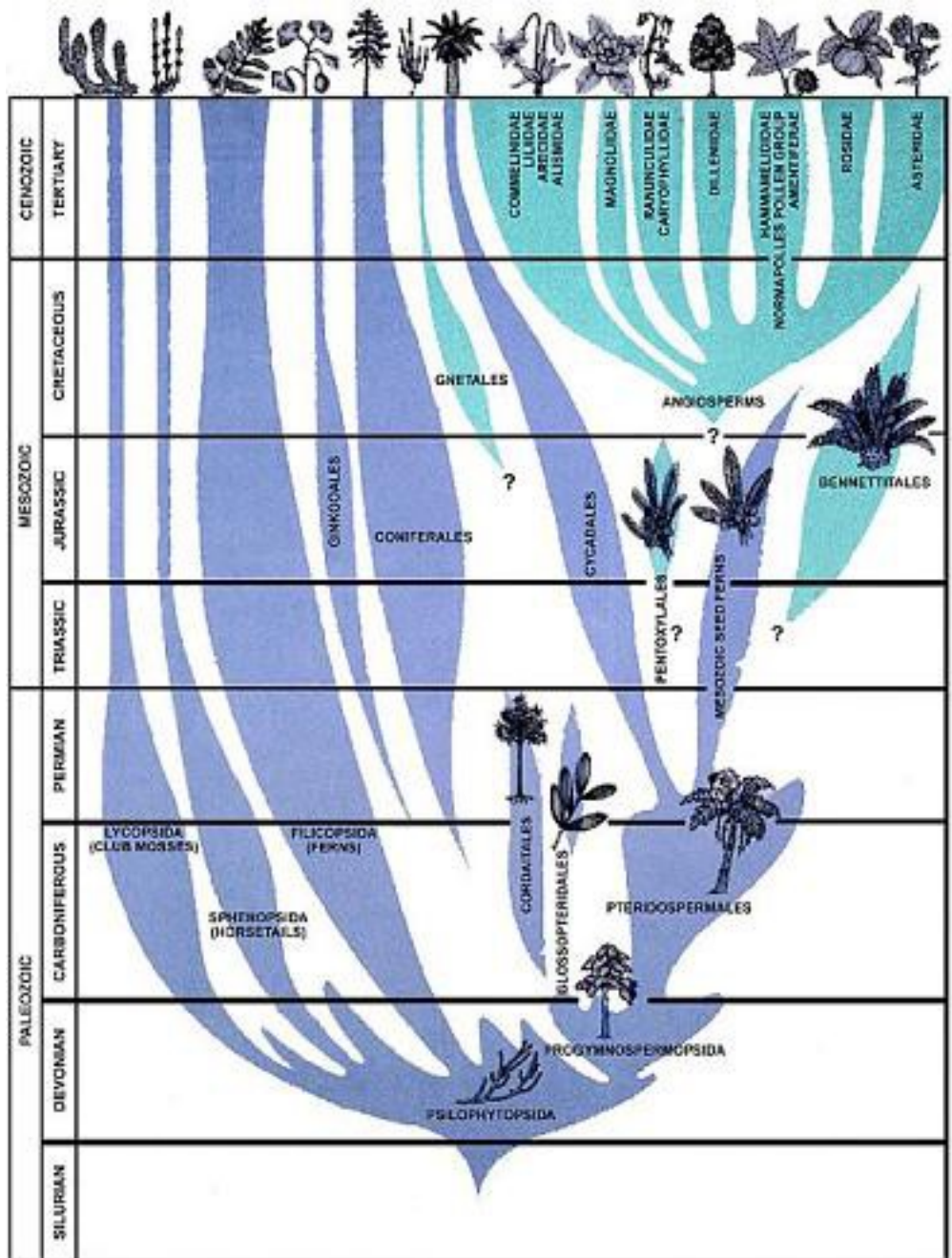
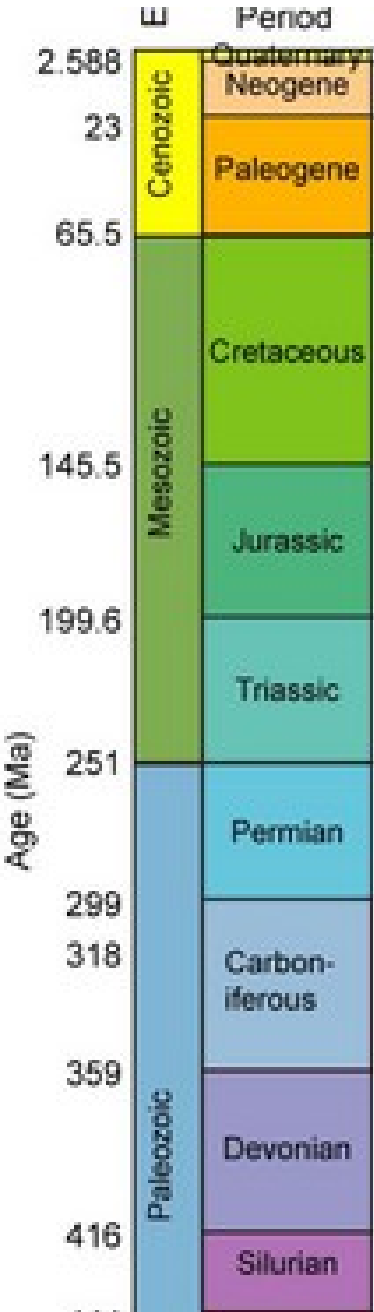




**DIVISIONS OF GEOLOGICAL TIME
SHOWING DEVELOPMENT OF PLANT AND ANIMAL LIFE**



707 x 1100



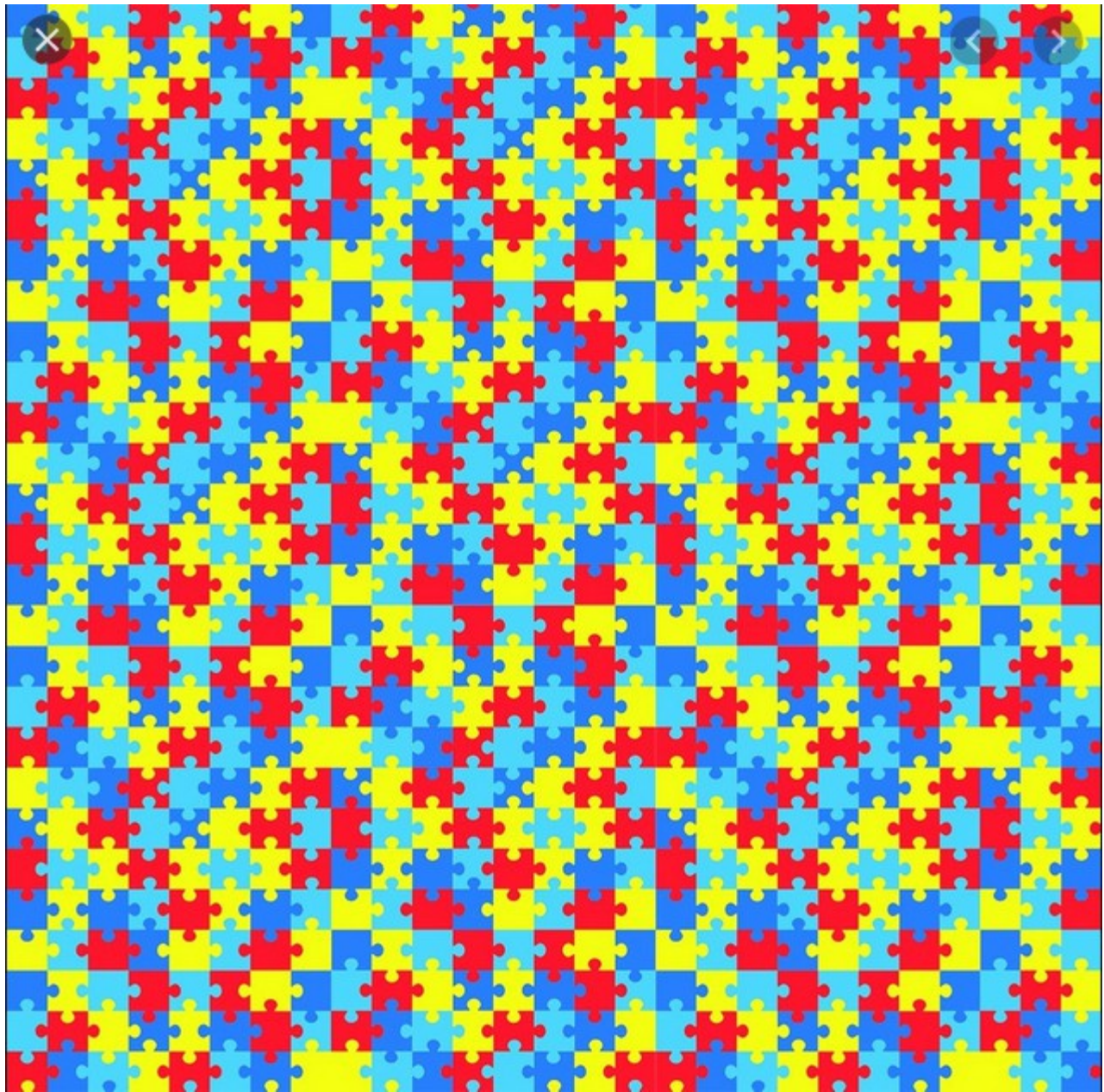
End-Ordovician, 444 million years ago, 86% of species lost--Graptolite 2-3 cm length¶

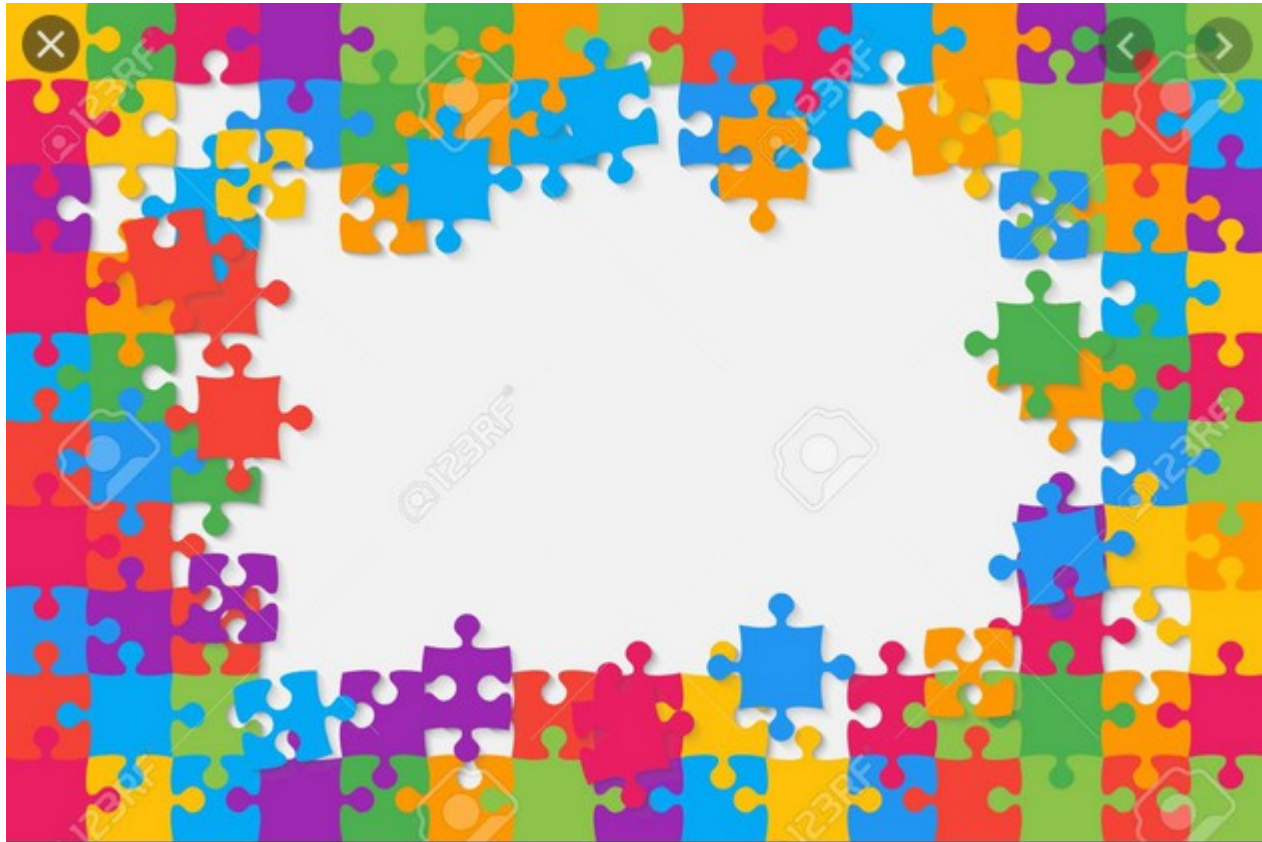
Late-Devonian, 375 million years ago, 75% of species lost--Trilobite, 5 cm length¶

End-Permian, 251 million years ago, 96% of species lost--A cataclysmic eruption near Siberia blasted CO₂ into the atmosphere. Methanogenic bacteria responded by belching out methane, a potent greenhouse gas. Global temperatures surged while oceans acidified and stagnated, belching poisonous hydrogen sulfide.¶

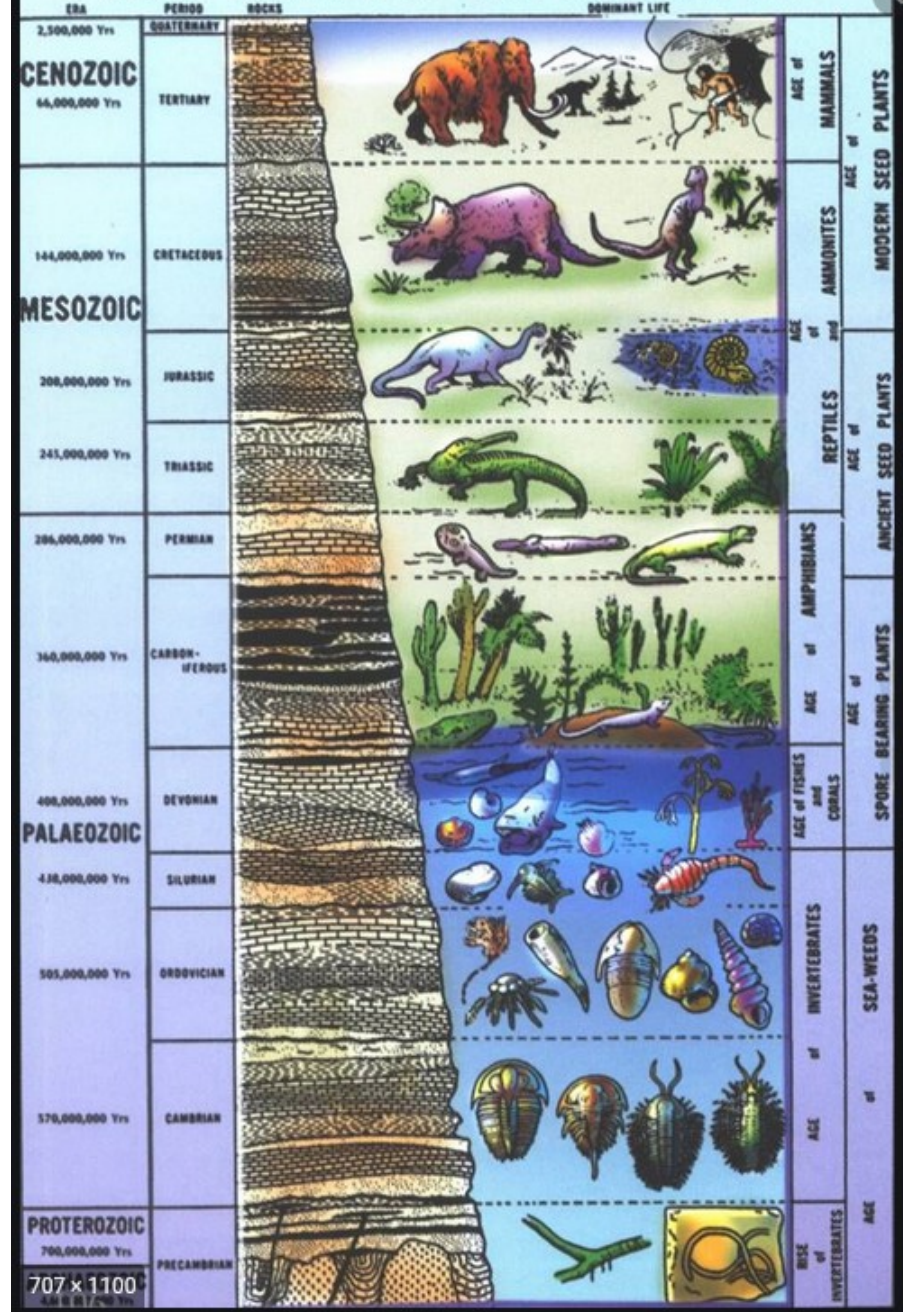
End-Triassic, 200 million years ago, 80% of species lost--Of all the great extinctions, the one that ended the Triassic is the most enigmatic. No clear cause has been found.¶

End-Cretaceous, 66 million years ago, 76% of all species lost--volcanic activity and climate change already placed the ammonites under stress. The asteroid impact that ended the dinosaurs' reign provided the final blow.¶



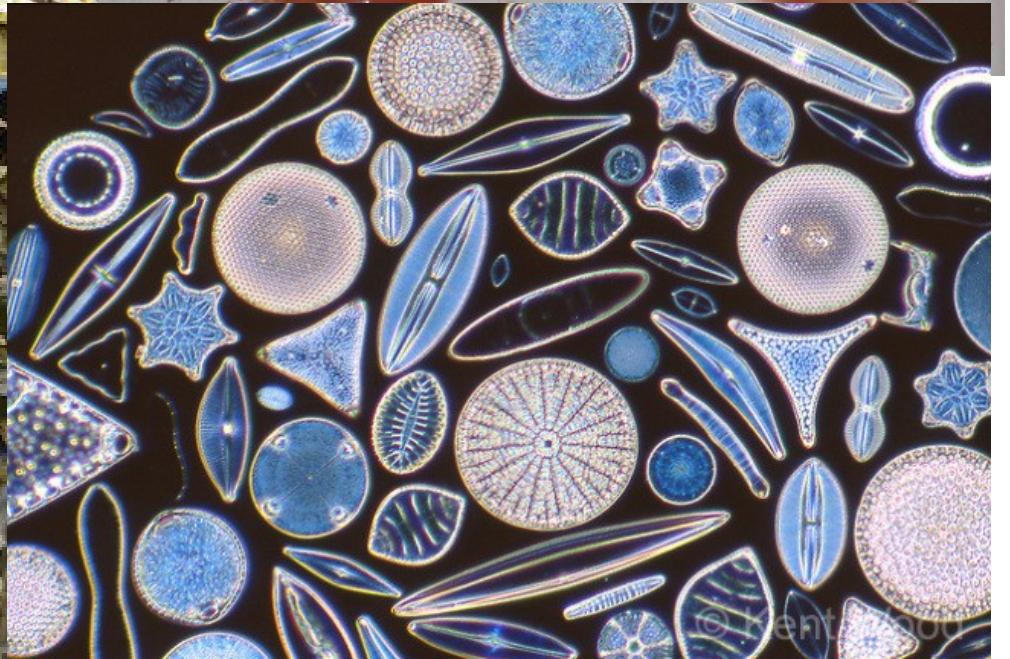
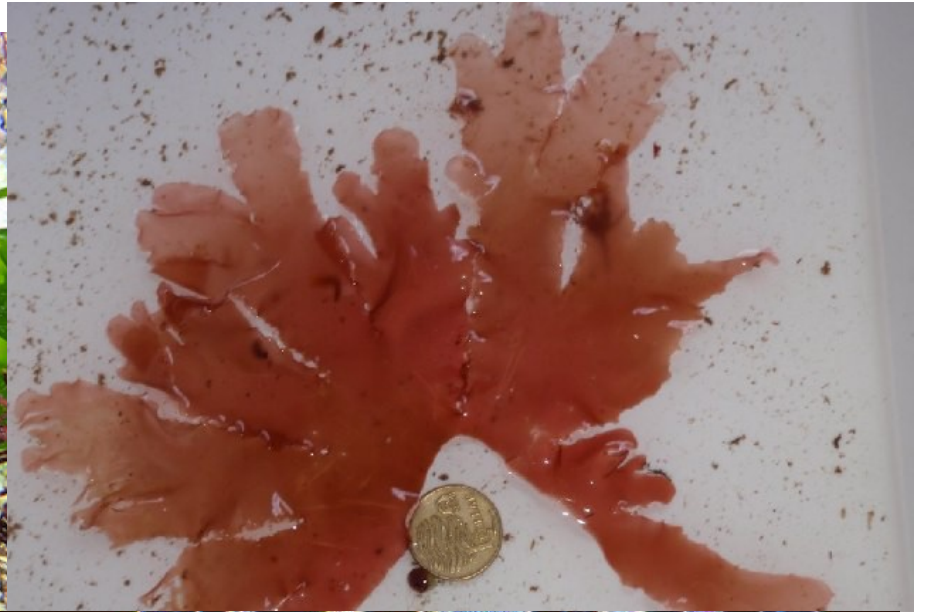


DIVISIONS OF GEOLOGICAL TIME SHOWING DEVELOPMENT OF PLANT AND ANIMAL LIFE











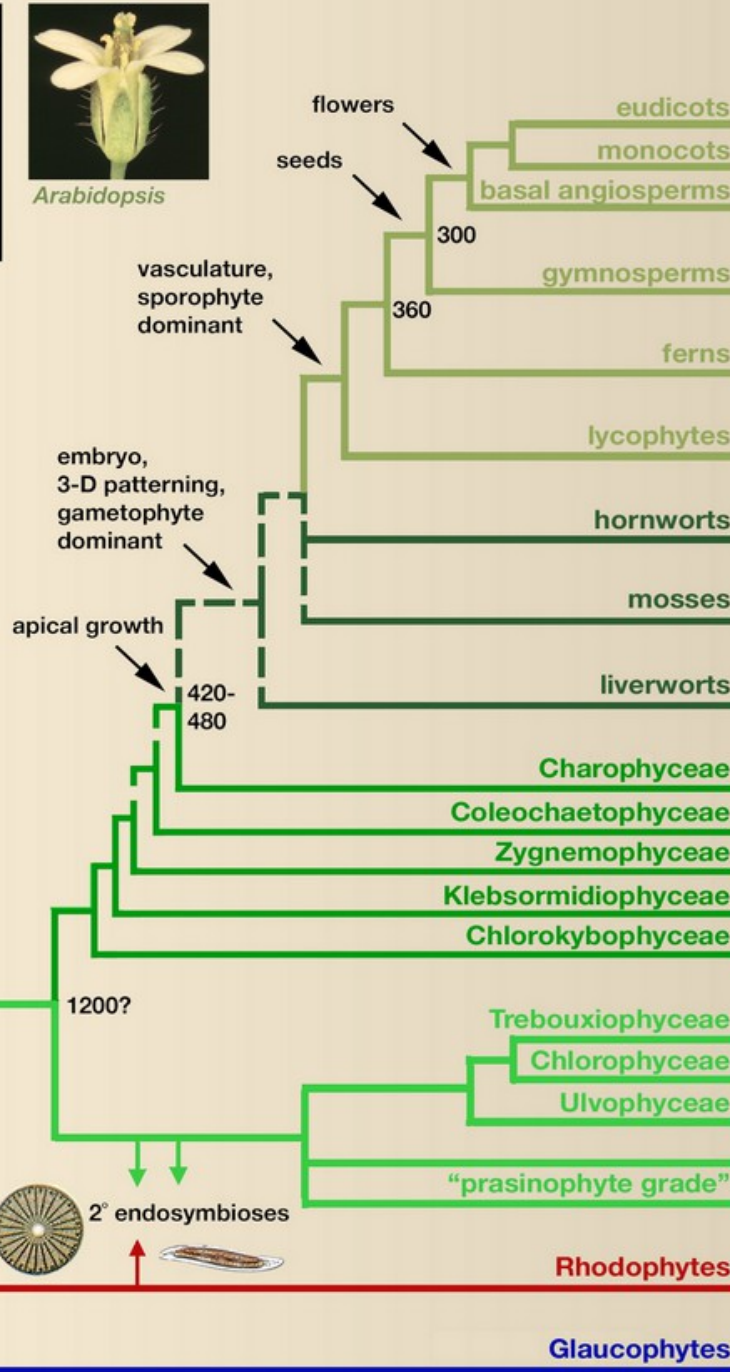
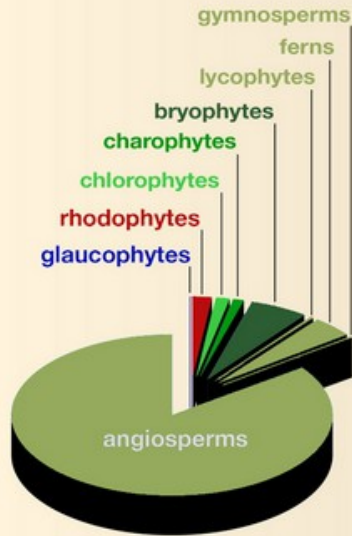
Populus



Oryza



Arabidopsis



vascular plants

- Opuntia
- Arabidopsis
- Populus
- Oryza
- Ginkgo
- Selaginella

bryophytes

- Physcomitrella
- Marchantia

charophytes

- Chara
- Coleochaete

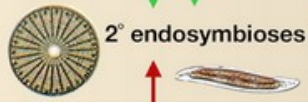
chlorophytes

- Trebouxiophyceae
- Chlorophyceae
- Ulvophyceae
- "prasinophyte grade"
- Ostreococcus
- Cyanidioschyzon

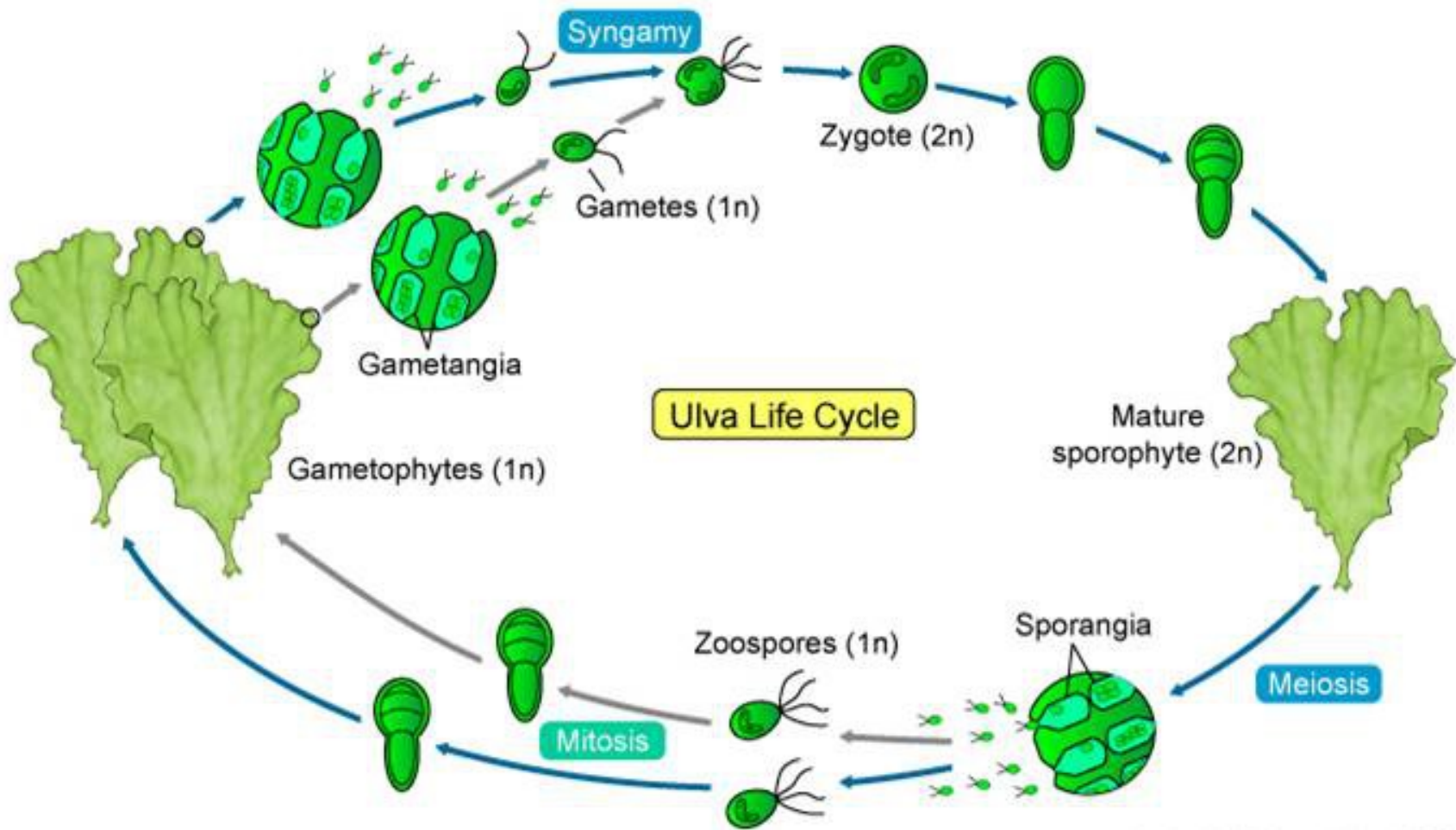
Rhodophytes

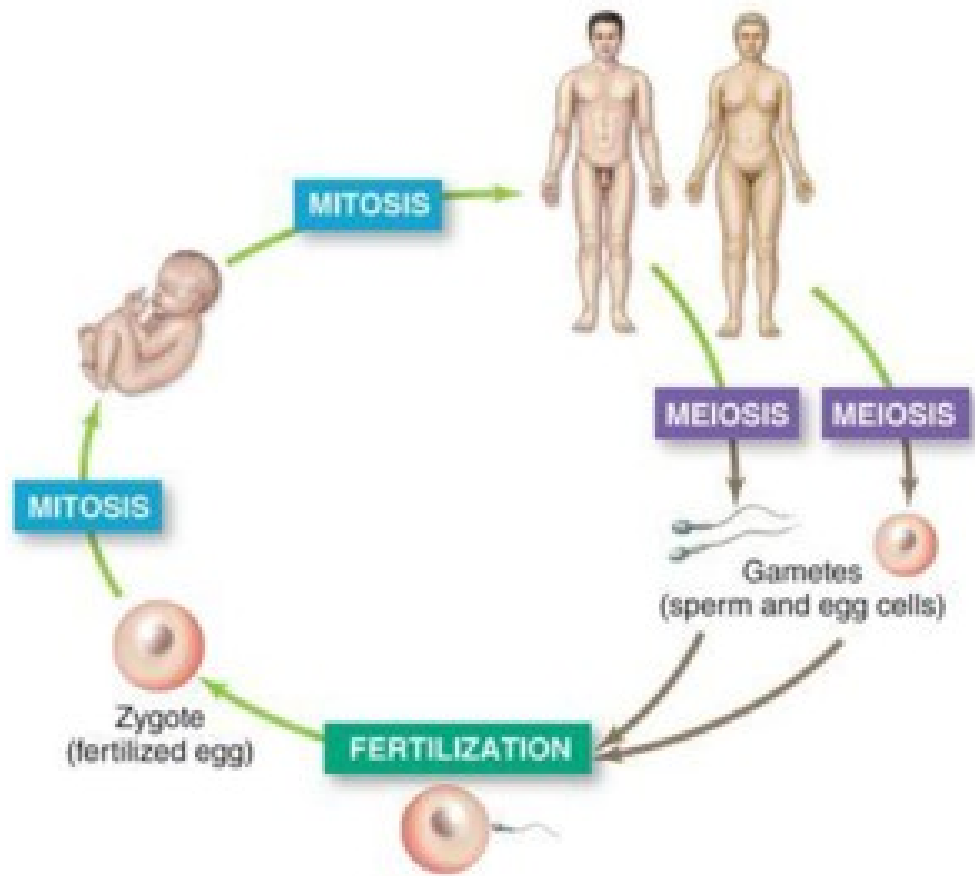
Glaucophytes

1° endosymbiosis of cyanobacterium



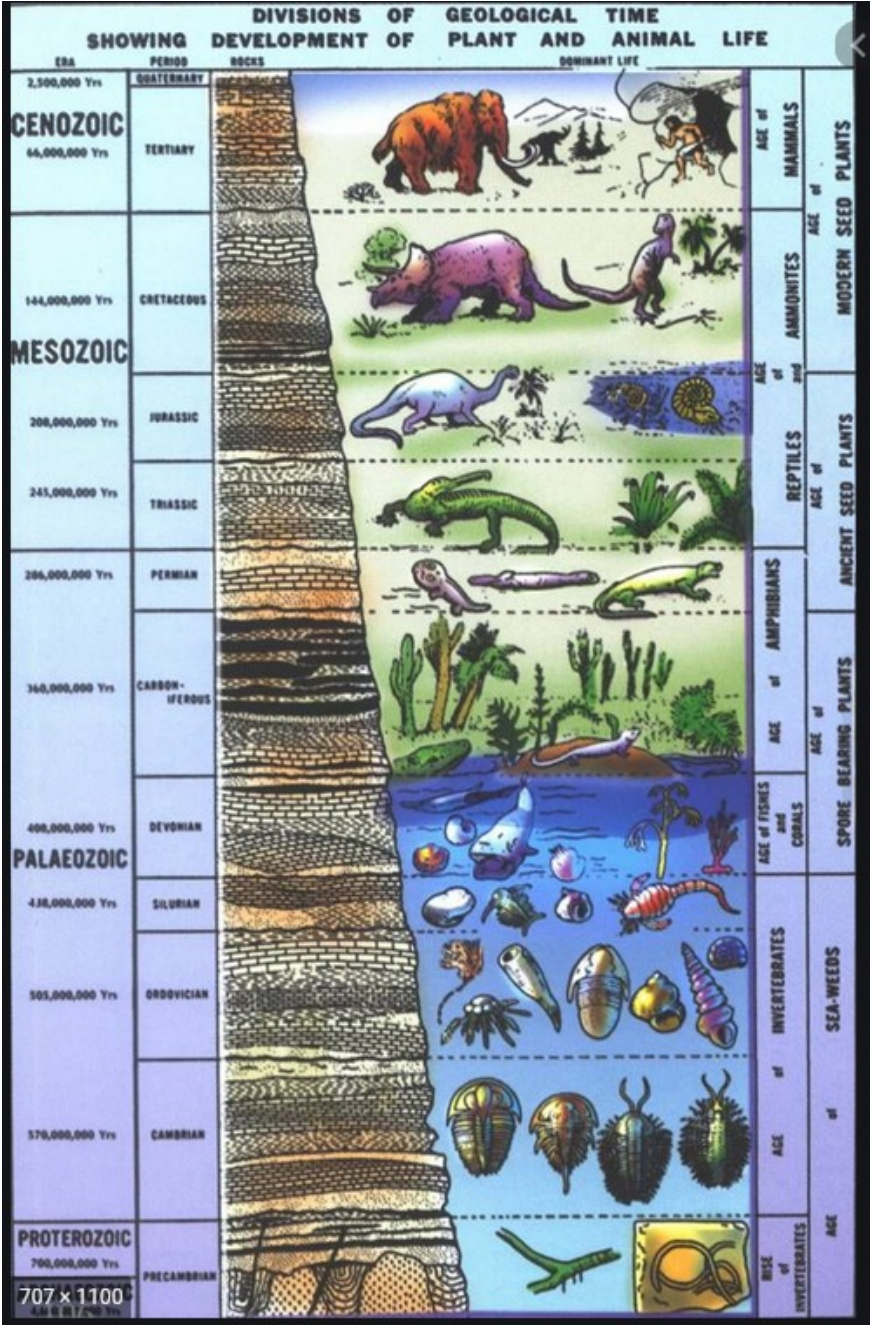
2° endosymbioses





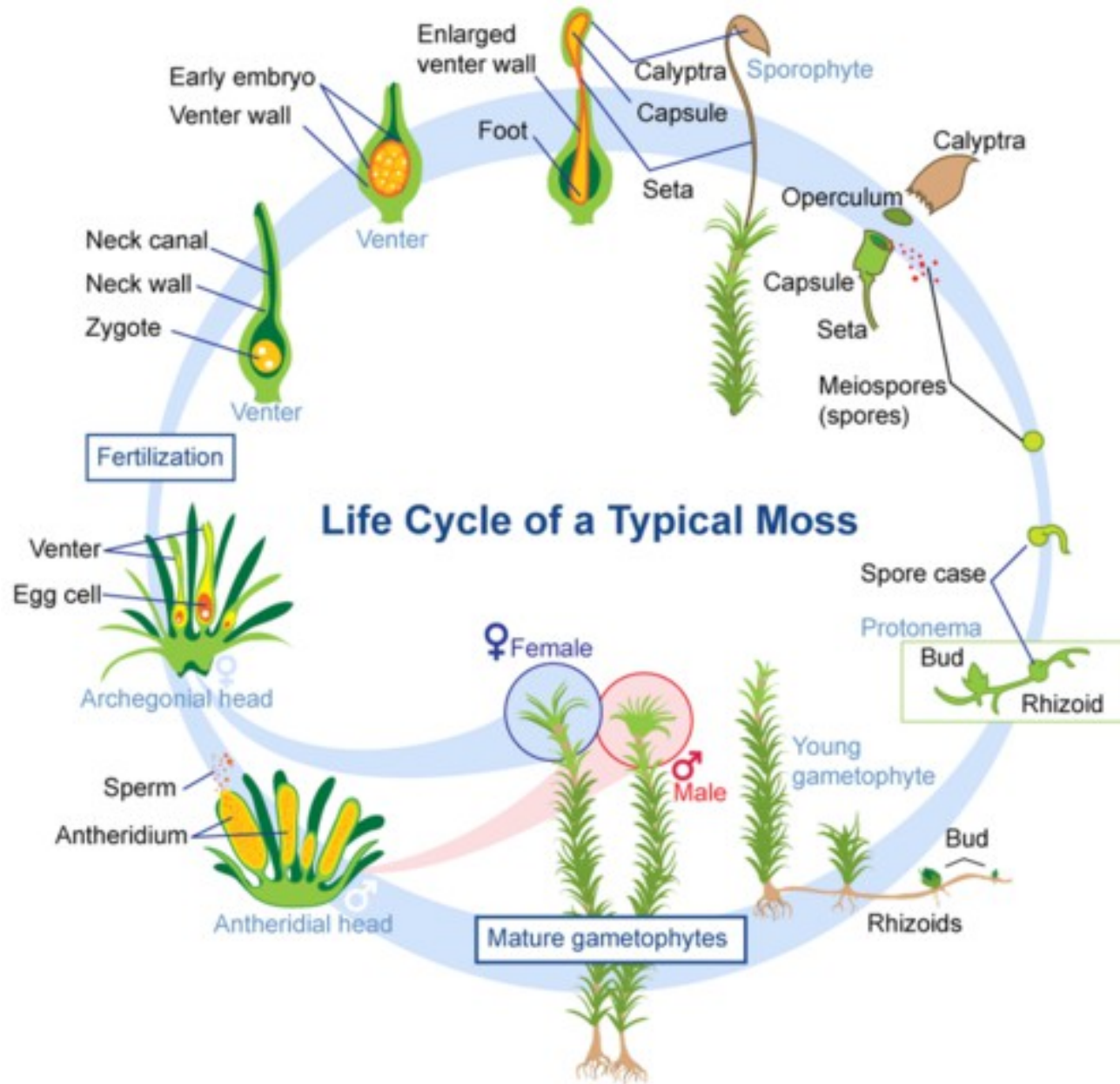


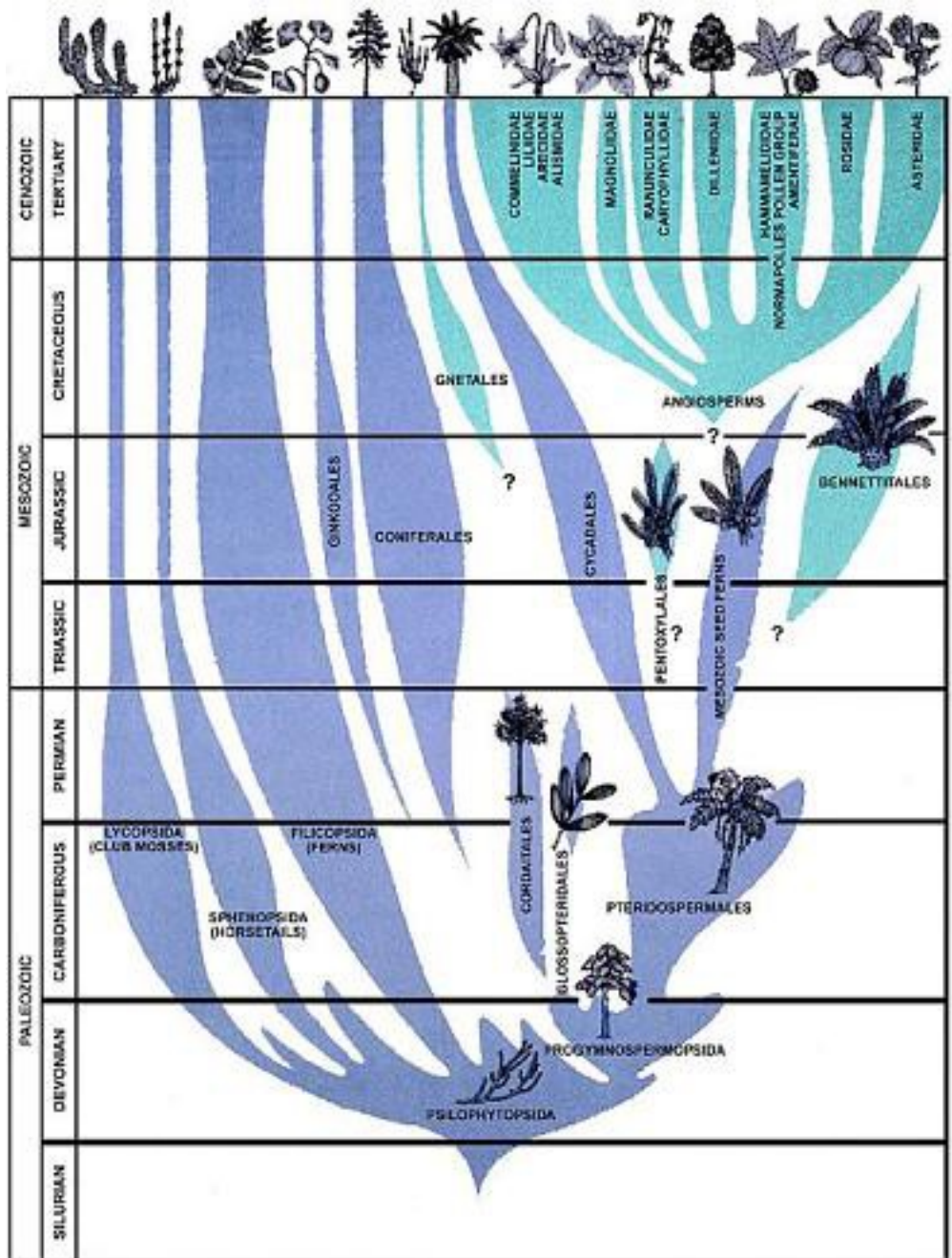
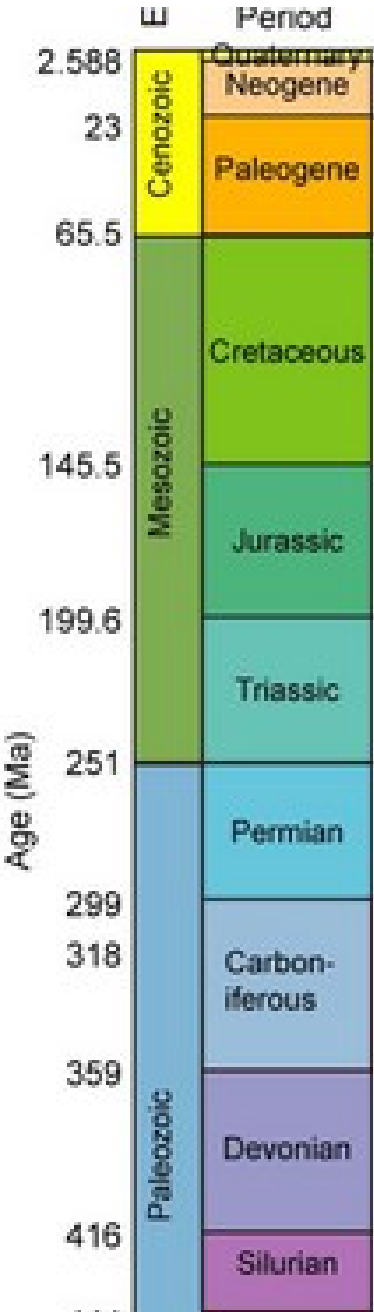












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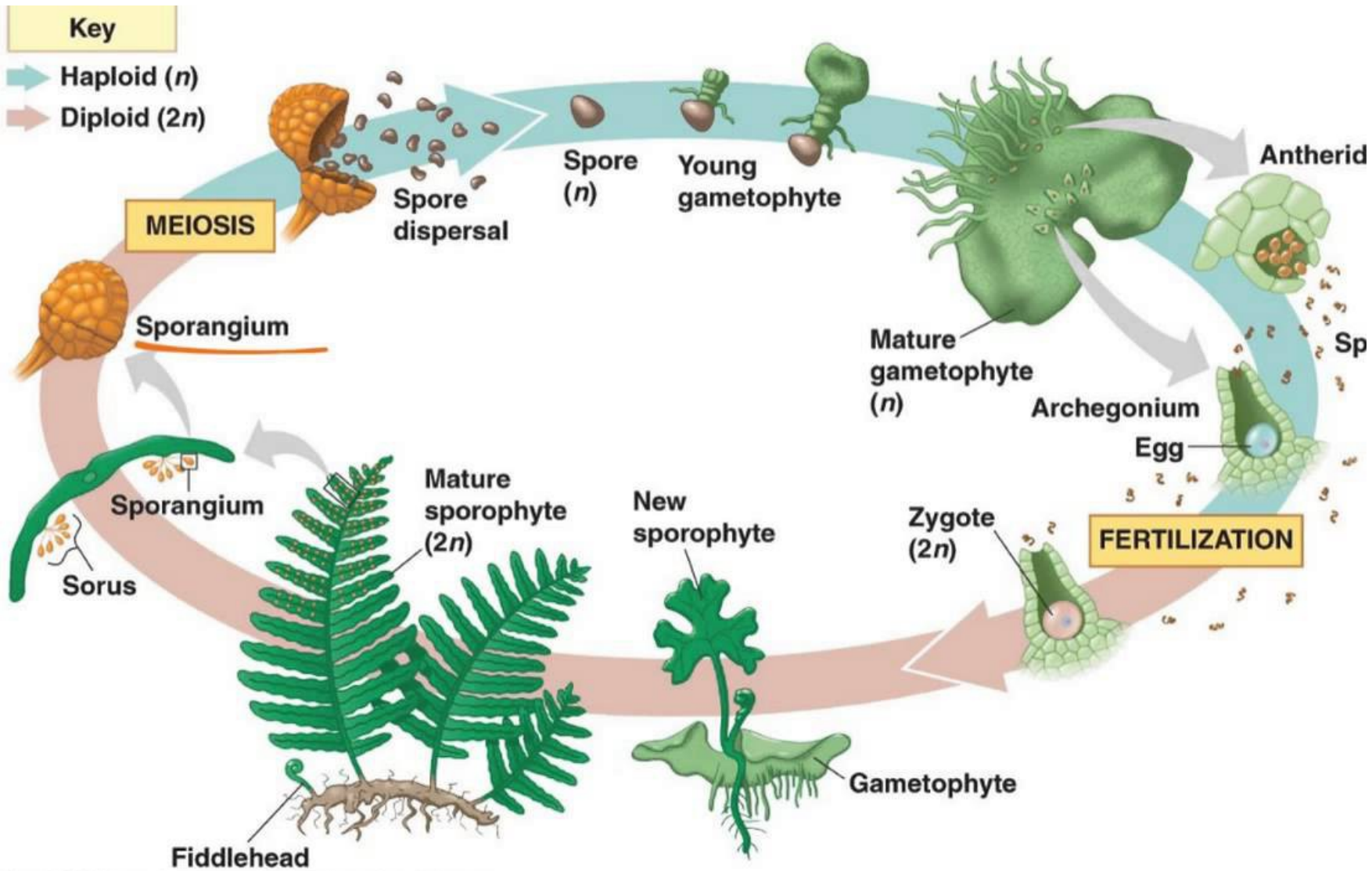
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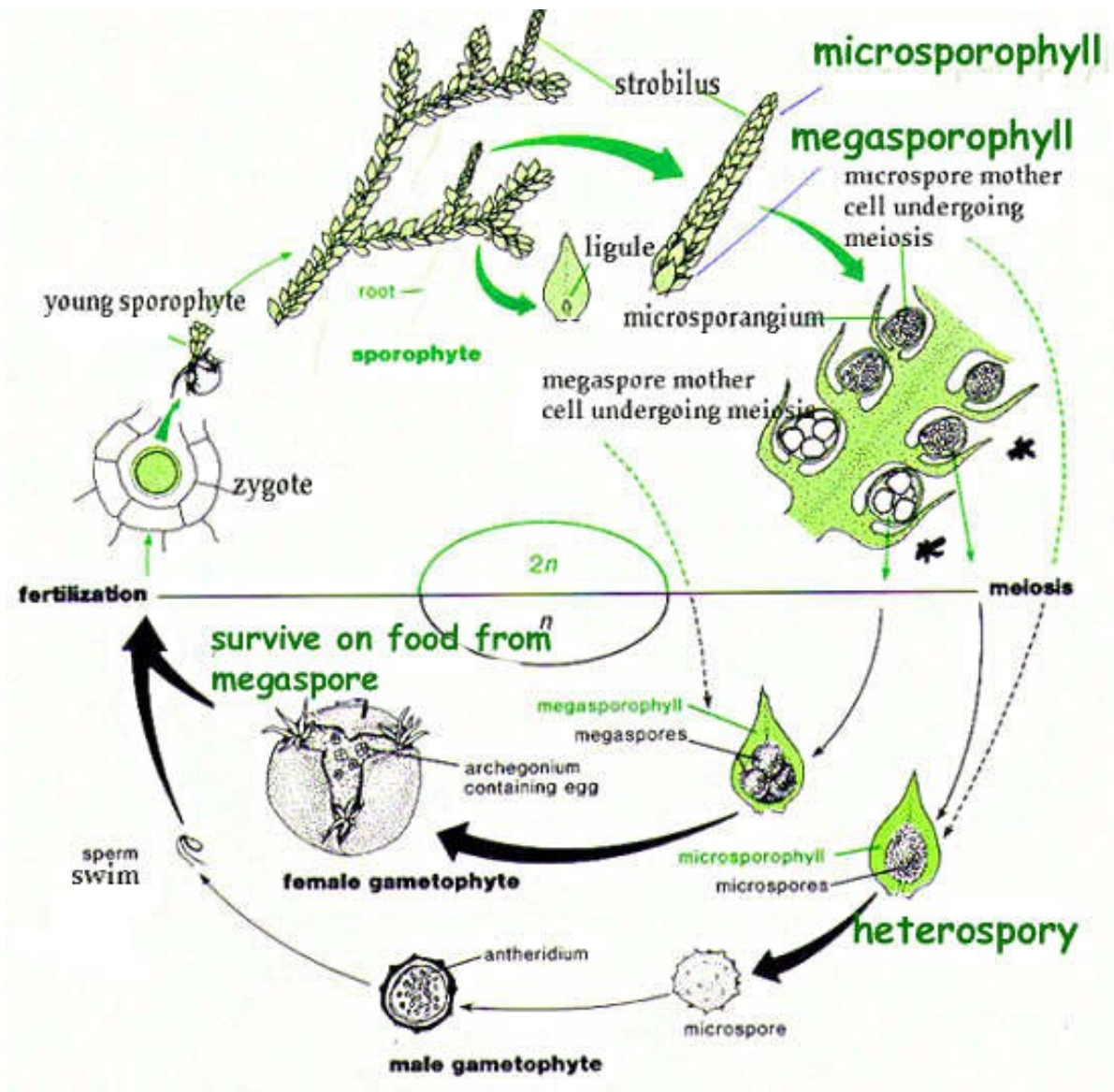


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Selaginella selaginoides



End-Ordovician, 444 million years ago, 86% of species lost - Graptolite 2-3 cm length¶

Late-Devonian, 375 million years ago, 75% of species lost - Trilobite, 5 cm length¶

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