

Earth Timeline

Objective: To create a timeline of the Earth's history.

Tasks:

1. Measuring and marking start and end points and each 100 million year increment
2. Label the 100 year increments in pen at the top of the paper.
3. Measuring and marking in pencil the times when certain organisms appear in the fossil record.
4. Coloring and gluing or drawing organisms on the timeline.

Instructions:

1. Each group will create one part of the timeline of Earth's history. The timelines from each group will be taped together into one very long timeline (4,600 million years).
2. One centimeter on your roll of paper will represent 1 million years and there are 100 cm in a meter.
3. Determine the time span for which your group was assigned (millions of years ago), and based on that length of time, determine how long your paper must be. Cut a length from the roll that is a little longer than you need.
 - Group 1: 4,600-2,000**
 - Group 2: 400-2,000**
 - Group 3: 300-100**
 - Group 4: 100-Today**
4. Leave a little room at one end and draw a vertical line and label the year that you are starting from. Measure from this distance to your ending year and label that year as well. Draw a vertical line for each 100 million year increment on your timeline (e.g. 500 mya, 600 mya, etc.)
5. One person should start measuring out and marking in pencil every 100 million years on your timeline. A second person can write the Date in pen at the top of the paper (e.g. 2,200 mya).
6. A third person should mark in pencil where major life forms appear in the fossil record and/or major extinction events. Some cut-out are provided, but for others you will have to draw the organisms into the timeline.

Earth's Timeline Based on the Fossil Record

Precambrian

- 4,600 Beginning of the Earth based on data from meteorites.
- 3,800 Oldest age-dated rocks on the present surface of the Earth.
- 3,500 Fossil evidence of cyanobacteria, also called blue-green algae.
- 1,750 Oldest fossil evidence of single-celled life with a nucleus (eukaryotes).
- 1,500 Oldest fossil multi-celled (metazoan) organisms, algae.
- 670 Oldest fossil jellyfish and marine worms.

Cambrian Period (542 to 488 million years ago)

- 542 The "Cambrian Explosion." Appearance of brachiopods, and trilobites.
- 530 Oldest fossil vertebrates, also the oldest fossil fish.

Ordovician Period (488 to 443 million years ago)

- 470 Oldest fossil evidence of land plants. The first plants looked like lichen.
- 440 End-Ordovician mass extinction.

Silurian Period (443 to 416 million years ago)

- 428 Oldest fossil evidence of vascular land plants, *Cooksonia*.

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Devonian Period (416 to 359 million years ago)

- 412 Oldest fossil insect, *Rhyniognatha*.
- 412 Oldest fossil lungfish, *Youngolepis* and *Diabolepis*.
- 409 Oldest fossil shark, *Doliodus*.
- 380 Oldest fossil large trees, *Eospermatopteris* (gymnosperms).
- 375 Oldest fossil amphibian, *Acanthostega*.
- 360 End-Devonian mass extinction.

Mississippian Period (359 to 318 million years ago)

- 330 Oldest fossil evidence of conifers, seed-bearing plants with cones.

Pennsylvanian Period (318 to 299 million years ago)

- 320 Oldest fossil evidence of reptiles, *Hylonomus*.
- 315 Oldest fossil evidence of flying insects, and therefore natural flight.

Permian Period (299 to 251 million years ago)

- 299 Sail-backed, mammal-like reptiles (synapsids), like *Dimetrodon*.
- 251 The End-Permian. The greatest mass extinction of all time.

Triassic Period (251 to 199 million years ago)

- 228 Oldest dinosaur fossil, *Eoraptor*.
- 221 Oldest mammal fossils (they looked like shrews).
- 210 Oldest turtle fossil, *Proganochelys*.
- 199 End-Triassic mass extinction.

Jurassic Period (199 to 145.5 million years ago)

- 155 Oldest fossil bird, *Archeopteryx*.

Cretaceous Period (145.5 to 65.5 million years ago)

- 142 Oldest flowering plants (angiosperms), *Archaeofructus*.
- 110 *Sauroposeidon*, perhaps the tallest dinosaur and land animal of all time.
- 75 Two of the longest, tallest, and heaviest, meat-eating dinosaurs of all time, *Tyrannosaurus rex*
- 65.5 End-Cretaceous mass extinction.

Tertiary Period (65.5 to 1.81 million years ago).

- 60 Oldest fossil rodents
- 57 Oldest hooved mammals, the condylarths, from North America.
- 55 Oldest fossil primates, *Teilhardina*.
- 55 Oldest fossil horse, *Hyractotherium*.
- 52 Oldest fossil whale, *Pakicetus*, from India.
- 50 Oldest fossil elephant, an unnamed fossil from Algeria.
- 49 Giant flightless birds, like *Diatryma* and *Gastornis*.
- 37 Oldest fossil dog, *Hesperocyon*.
- 25 Oldest fossil cat, *Proailurus*.
- 4 *Australopithecus*, the oldest hominid (human-like ancestors) fossils from Africa.
- 2.5 *Homo habilis*, a hominid from Africa that made crude spear points.

Quaternary Period (1.81 million years ago to the present)

- 1.2 *Homo erectus*, the oldest evidence of hominids outside of Africa.
- 0.50 Neandertal man, *Homo sapiens neandertalis*.
- 0.09 Cro-Magnon (modern) man, *Homo sapiens sapiens*.