

Dinosaurs unit study

Turn a dinosaur obsession into a full homeschool curriculum — reading, math, science, history and art built around paleontology, for K-12.

GRADE BANDS K-2 · 3-5 · 6-8 · 9-12

FULL GUIDE <https://handsdowneducation.com/homeschool/dinosaurs>

How to use this planner

The six weeks below are the guide's authored scope and sequence: one focus, one key activity and one portfolio output per week. Run the activity at the level your child is at (the grade band notes tell you how), keep the output, and by week six you have a portfolio that shows the unit end to end.

Pace is yours. A week here is three to five working sessions; a topic that is going well can take two calendar weeks, and one that has run dry can be closed early. Tick the box when a week's output is in the portfolio.

Six-week scope and sequence

Wk	Focus	Key activity	Portfolio output	Done
1	What is a dinosaur?	Define the group by hip structure and posture; sort dinosaurs from non-dinosaurs (pterosaurs, plesiosaurs, Dimetrodon) using a trait checklist.	A sorting chart with the evidence for each decision.	☐
2	How fossils form	Sediment jar model plus a plaster cast fossil; read about the conditions that preserve bone and why complete skeletons are rare.	Labeled cross-section drawing and a paragraph explaining the layers.	☐
3	Deep time and the Mesozoic	Build a scaled timeline of the Triassic, Jurassic and Cretaceous; place ten species and one mass extinction on it.	A timeline poster or tape with calculations shown.	☐
4	Reading the bones	Measure and compare skeletal features (teeth, femur, skull) from museum references; infer diet, speed and size with ratios.	A data table and bar graph with a written interpretation.	☐
5	Where and why: fossil geography	Map major fossil beds against Pangaea; trace how continental drift explains related species on separate continents.	An annotated map with a short explanation of the pattern.	☐
6	Extinction and legacy	Weigh the evidence for the end-Cretaceous impact; study birds as living dinosaurs; assemble a museum-style exhibit of the unit's work.	A final exhibit, field guide or presentation with an evidence-based claim.	☐

Running it at your child's level

Grades K-2: sorting, naming and noticing

Young children already do the first job of a paleontologist — they look closely and sort. A K-2 dinosaur unit study is mostly observation, vocabulary and comparison, with reading and counting hidden inside the play. Keep the real names: a child who says *Pachycephalosaurus* with confidence is decoding a five-syllable word.

- Sort a pile of toy dinosaurs three ways — by what they ate, by how they moved (two legs or four) and by size — and say out loud what evidence tells you each answer. Teeth shape is the clue for diet; that is real science.
- Make a fossil in a paper cup: press a shell or a plastic skeleton into clay, pour plaster over it, and dig it out the next day. Talk about which parts of a real animal turn to stone and which rot away.
- Measure the family against a dinosaur: stretch a tape measure to 12 meters (a *Tyrannosaurus*) down the sidewalk and count how many of your child it takes to reach the end. Record the count in a notebook.
- Build a picture timeline with three cards — Triassic, Jurassic, Cretaceous — and place five favorite dinosaurs

on the right card. The point is that dinosaurs did not all live at once; Stegosaurus and T. rex never met.

Reading: Dinosaur Bones by Bob Barner (a rhyming read-aloud about what bones tell us) and Boy, Were We Wrong About Dinosaurs! by Kathleen Kudlinski, which shows how scientists change their minds when new evidence turns up.

Grades 3-5: evidence, measurement and the fossil record

Upper elementary is where a dinosaur unit turns from collecting to reasoning. Children can now handle real data — measurements from museum specimens, dates in millions of years, maps of where fossils are found — and ask what the pattern means. This is also the age for the story of the science: the Bone Wars, Mary Anning's ichthyosaur, and how the bird-dinosaur link was argued.

- Build a sediment jar with sand, gravel, soil and water, let it settle, and label the layers. Then draw a cross-section showing where a fossil from 150 million years ago would sit compared with one from 70 million years ago and explain the rule (older is deeper, unless the layers have been disturbed).
- Use published femur lengths for five species to estimate body length with a simple ratio, graph the results as a bar chart and check them against the lengths given in a reference book. Where the estimate is off, discuss why (posture, tail length, incomplete skeletons).
- Read a short biography of Mary Anning, then write a first-person account of finding a fossil on the Lyme Regis shore: what she saw, what tools she used and what she thought it was.
- Map the fossil beds: on a world map mark Hell Creek (Montana), the Morrison Formation (Colorado and Utah), the Gobi Desert (Mongolia) and Patagonia (Argentina). Then compare with a map of Pangaea and ask why related dinosaurs turn up on continents that are now oceans apart.

Reading: National Geographic Kids Ultimate Dinopedia by Don Lessem, which pairs a page per species with current science, is the reference to keep open all unit; The Dinosaur Hunters chapter in any children's history of paleontology covers Cope and Marsh.

Grades 6-8: deep time, cladistics and the case for birds

Middle schoolers can work with the actual tools of the field: geologic time scales, family trees built from shared traits, and the standard of evidence a claim has to meet. The unit shifts from what dinosaurs were to how we know — and where the reasoning is still being argued.

- Build a cladogram by hand: give your student a list of ten animals (including a crocodile, a pigeon, Velociraptor, Stegosaurus and a lizard) and a table of traits (hip structure, feathers, wishbone, hollow bones). Group them by shared traits and defend the tree. Then compare it with a published one.
- Model deep time on a roll of toilet paper or adding-machine tape at one sheet per million years. Mark the first dinosaurs, the Jurassic, the end-Cretaceous extinction and the first humans. The gap between T. rex and today is smaller than the gap between T. rex and Stegosaurus — have your student calculate it.
- Read a plain-language summary of the Chicxulub impact evidence (the iridium layer, shocked quartz, the crater itself) and write a one-page argument: what evidence would convince a skeptic, and what a competing explanation — Deccan volcanism — still explains.
- Reconstruct a dinosaur from a skeletal drawing, adding muscle and skin in layers, then write a caption stating which features are known from fossils and which are informed guesses (color, sound, behavior).

Reading: Dinosaurs: The Grand Tour by Keiron Pim, an accessible species-by-species survey with current science, and selected chapters of Steve Brusatte's The Rise and Fall of the Dinosaurs read aloud or with support.

Grades 9-12: paleontology as a working science

High schoolers can treat the unit as an introduction to earth science and evolutionary biology with dinosaurs as the case study. The work is reading real sources, handling real datasets and writing in the genres scientists use. Done at this depth, a six-week dinosaur unit is a legitimate slice of a biology or earth science credit.

- Read the abstract and introduction of a recent open-access paleontology paper (many are on PLOS ONE or PeerJ), summarize the claim, the evidence and the method in a page, and note one thing the authors say they still do not know.
- Use a public specimen database or museum measurement table to test a hypothesis — for example, whether skull length scales linearly with body mass across theropods — with a scatter plot and a line of best fit, then discuss what the outliers mean.

- Write a literature-review style essay on the origin of feathers: when they appear in the fossil record, what functions have been proposed (insulation, display, flight) and how the evidence for each holds up.
- Run a debate on de-extinction and the limits of ancient DNA: what is technically possible with mammoths, why it is not possible with dinosaurs, and what the ethics of either would be.

Reading: *The Rise and Fall of the Dinosaurs* by Steve Brusatte, a narrative of current paleontology written by a working researcher; pair it with the Natural History Museum (London) Dino Directory for species-level detail.

A sample week, subject by subject

Reading & Writing

Read a chapter on the Bone Wars rivalry between Cope and Marsh, then write a diary entry as a fossil hunter racing a rival dig team.

Math

Compare femur lengths across five species and scale them to estimate full body sizes — ratios and proportional reasoning with real museum data.

Science

Build a sediment jar to model how fossils form in layers, then explain why finding a T. rex below an Allosaurus would rewrite the textbooks.

Social Studies

Trace how Pangaea split into today's continents and mark where major fossil beds sit on a modern map — and why they are where they are.

Art

Produce a labeled scientific illustration of one dinosaur, drawn from skeletal reference the way paleoartists actually work.

Books, sites and kits

- National Geographic Kids Ultimate Dinopedia (Book (3-5)) — One page per species with a current-science summary; the reference to keep open for the whole unit.
- *Dinosaur Bones* by Bob Barner (Book (K-2)) — A rhyming picture book about what bones can and cannot tell us about the animals that had them.
- *The Rise and Fall of the Dinosaurs* by Steve Brusatte (Book (9-12)) — A narrative history of dinosaur science by a working paleontologist; chapters stand alone well for middle school read-alouds.
- Natural History Museum (London) Dino Directory (Website) — A free, searchable database of dinosaur species with size, diet, era and where the fossils were found.
- American Museum of Natural History OLogy (Website) — Free paleontology activities and interviews with museum scientists written for children.
- Smithsonian National Museum of Natural History Deep Time hall (online) (Website) — Fossil hall resources and images that put dinosaurs inside the full history of life on Earth.
- PBS Eons (Video series) — Short, well-sourced episodes on the history of life, including many on specific dinosaurs and the end-Cretaceous extinction.
- National Geographic Dinosaur Dig Kit (Kit) — A plaster block with real fossil specimens to excavate — a good week-two hands-on companion to the sediment jar.

Standards this unit covers

- 3-LS4-1 (NGSS) — Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.
- 4-ESS1-1 (NGSS) — Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.
- MS-LS4-1 (NGSS) — Analyze and interpret data for patterns in the fossil record that document the existence,

diversity, extinction and change of life forms throughout the history of life on Earth.

- MS-LS4-2 (NGSS) — Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.
- MS-ESS2-3 (NGSS) — Analyze and interpret data on the distribution of fossils and rocks, continental shapes and seafloor structures to provide evidence of past plate motions.
- CCSS.ELA-LITERACY.W.4.2 (CCSS ELA) — Write informative/explanatory texts to examine a topic and convey ideas and information clearly — the dig reports, captions and exhibit text.

Common questions

Is a dinosaur curriculum too narrow to cover state standards?

The dinosaurs are the theme, not the ceiling. Fractions practice uses fossil measurements instead of pizza slices; the standards coverage is the same, the engagement is not.

How long can a dinosaur unit realistically hold attention?

A deep interest typically anchors 4-8 weeks comfortably. When attention shifts — often toward space or ocean life — the curriculum shifts with it, keeping skills continuous across themes.

What if I know nothing about dinosaurs myself?

You do not need to. The plan supplies the content sequence; your child likely supplies more raw enthusiasm for the subject matter than any parent could.

What should a dinosaur unit study include?

A complete dinosaur unit study has five parts: a reading spine (one nonfiction book at your child's level, read across the unit), a science strand (how fossils form, how paleontologists read them, and how dinosaurs relate to living animals), a math strand built on real measurements, a geography and deep-time strand (Pangaea, the Mesozoic eras, why fossil beds are where they are), and a final product — a museum exhibit, a field guide, or a presentation. The six-week scope and sequence above is one way to arrange those parts.

Can I run a dinosaur unit study with several ages at once?

Yes, and it is one of the easiest topics to do that with. Everyone reads or listens to the same book and does the same hands-on activity; the output changes by age. A six-year-old labels a drawing of the fossil dig, a ten-year-old writes the dig report with measurements, and a fourteen-year-old argues from the same evidence whether the animal was a scavenger or a hunter. The grade-band sections above are written so you can pick one row per child from the same week.

How much does a dinosaur unit study cost to put together?

Nearly nothing if you lean on the library and free museum resources. The essentials are a good nonfiction book, a tape measure, a jar for the sediment model, and printouts of skeletal references from museum websites. A fossil dig kit and a museum trip are worthwhile extras, not requirements. Most of the resource list below is free online.

Turn this into a full, standards-aligned curriculum

Generate a complete plan around dinosaurs for your child's grade and pace — free to try, no account required.

<https://handsdowneducation.com/curriculum/generate>