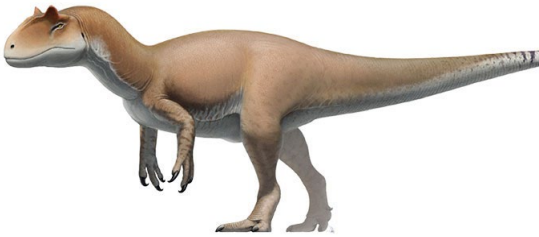
Flying Dinosaurs

Introduction



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As the only living descendants of dinosaurs, birds have an extremely long and complex history. What birds look like now, where they live, how they act, and how they communicate, are all connected to how they evolved in relation to each other.

Birds evolved from a group called the theropod dinosaurs that included bipedal carnivores such as *Tyrannosaurus rex* and *Velociraptor*. The meteor strike that caused the extinction of the dinosaurs 65 million years ago also may have started the rapid evolution of bird species. Kids can explore the common ancestry of theropods and birds and "evolve" their own dinosaur into a bird that flies.

Supplies

- Images of different birds
- Images of theropod dinosaurs
- Blank white paper and/or construction paper
- Scissors
- Markers or crayons
- Stapler, glue, tape
- Paper Clips
- Tape measure
- Stopwatch or stopwatch app

Get kids thinking ...

ASK: What makes a bird a bird? How are birds different from other animals? Make a list (birds lay eggs, most fly, have beaks or bills, have wings and feathers, many build nests, etc.) together so that everyone can see and agree on what all birds have in common. While looking over the list, ask kids to think about other animals and consider what is unique about birds (feathers).

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Share that the oldest known bird *Archaeopteryx* had feathers, teeth, claws on the wings, and a bony tail as long as the rest of the body. *Archaeopteryx* provides fossil evidence that birds are close relatives to reptiles. But which reptiles? (Dinosaurs)

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ASK: Do dinosaurs still live among us? Why don't we see a *T. rex* or *Velociraptors* when we go outside? What happened to these animals?

Talk about how some dinosaurs became extinct while some evolved. Share images of a variety of birds and theropod dinosaurs (Cornell Lab's Bird Academy Wall of Birds academy.allaboutbirds.org/features/wallofbirds is a good resource for both) to explore and discuss the similarities and differences of birds and their dinosaur ancestors.

Let's get started!

Archaeopteryx was probably capable of flight, but many theropod dinosaurs could not fly even though many had traits needed for getting airborne, such as feathers and light, hollow bones. And not all birds fly the same way. Some birds, like hummingbirds, hover and zip around. Other birds soar through the air.

ASK KIDS to think about what accounts for these differences in flight and apply their ideas to creating a dino bird or modern bird paper airplane.

STEP 1: Choose a bird or theropod. Wing and body shape affect how both a bird and a paper airplane will fly. Let kids get another look at images of a variety of birds and avian theropod dinosaurs and choose one that they will reimagine and make into a paper airplane.

STEP 2: Take time to explain lift and why wing shape is important to flight. Lift is what's needed to overcome gravity. Lift is a force that is created when something solid moves through air. Without air or motion, there is no upward force of lift. Demonstrate how it works by holding a strip of paper below your bottom lip and blow air over it.

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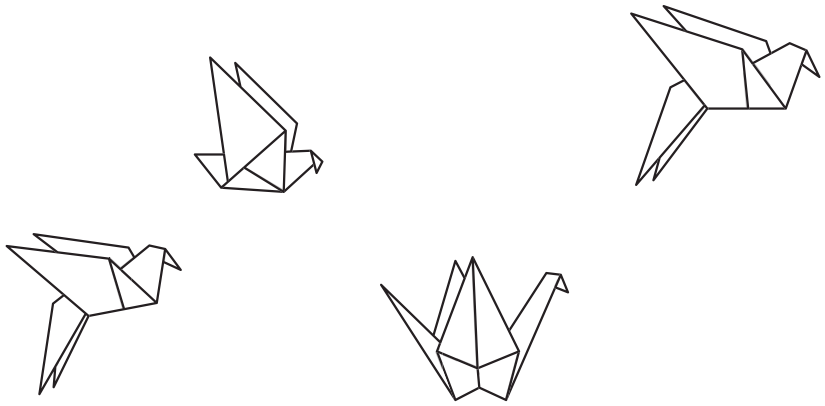
STEP 3: Provide paper and some basics on folding paper airplanes. Some kids may want to use a template, but encourage everyone to experiment with a variety of folding techniques that will result in creating a plane with wings and a body shape that represents the dino bird or modern bird they have chosen to make. Allow for test flights of planes before kids draw, color, cut out, and add distinguishing characteristics, such as:

- Wing feathers
- Tails
- Tail feathers
- Besk (bill)
- Teeth
- Legs and feet
- Claws
- Eyes



STEP 4: Build the paper planes. Provide a stapler, glue, and/or tape for attaching bird or dino bird parts. Encourage kids to use markers or crayons to add any additional features to their creation. Counterweights may need to be added to some planes to help stabilize planes with generous additions of distinguishing characteristics. Offer paper clips and let kids do test runs to get weight in the right places.

STEP 5: Once planes are ready, have kids observe them in flight: how far each flies, its flight pattern, how long it stays up, etc. Then set up a test to compare the flights of the modern bird planes with the dino birds to discover which will fly the furthest or which stays in the air the longest.

It's easier to measure if each plane gets thrown one at a time, but have planes paired — one modern bird and one dino bird — for each test. Before a plane is thrown, have kids look at both planes and offer their hypotheses on distance and hang time. Have each plane thrown from the same starting point and have someone time how long each plane stays in the air. Then have someone measure the distance it traveled. Kids can write observations in the results table (see next page) for their own planes or collect data on all the planes.

HYPOTHESIS

I think _____

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RESULTS

STEP 6: After each plane has flown in a test, have everyone take a look at the data and see what conclusions kids come up with. Look at which type of plane model went the

Name of Bird or Dino Bird	Time	Distance

furthest, which flew the longest, and ask kids why they think that's the case. Have them share their ideas about wings and body shape, size, weight, and feathers.

More flying activities

THESE PAPER AIRPLANES FLY LIKE BIRDS (AUDUBON FOR KIDS)
audubon.org/news/these-paper-airplanes-fly-birds

BIRD INSPIRED PAPER PLANE EXPERIMENT (WILD & IMMERSIVE)
wildlearnings.ca/paper-planes

FLYING PAPER BIRDS (PROJECT BEAK)
projectbeak.org/teacher/pdf/adaptations_wings_and_flight_paper_airplances.pdf

BIRDS AND THE WIND SHAPE
birds.cornell.edu/k12/wp-content/uploads/2018/09/BirdWingTypes-Handout.pdf

PAPER AIRPLANE DESIGNS
foldnfly.com