

The Four-Winged Dinosaur

Today we will be watching a Nova documentary called "The Four-Winged Dinosaur." The documentary follows two teams of scientists as they create replicas of microraptor, a dinosaur with four feathered wings, in an attempt to determine how flight evolved in birds (from the ground up or from the trees down). As you watch the video, think about each hypothesis and pay attention to the lines of evidence presented on both sides of the argument. **You will be responsible for writing a short essay (~1 page, typed) describing which origin of flight hypothesis you believe is the most plausible and why.** Your essay should include a brief both of these hypotheses (and any other pertinent background info), but you should focus on the evolution of flight in birds. Be sure to support your argument with evidence presented in the video. This essay is due in class on Wednesday, November 11th.

Answers to the following questions should help you write an effective argument. These are only guidelines, so feel free to take additional notes as you see fit.

1. What was the most plausible function of feathers in theropod dinosaurs like deinonychus?
2. What made microraptor a unique feathered dinosaurs?
3. Describe the two theories about how flight developed in birds.
4. Based on his analysis of the microraptor fossil, what was Xu Xing's original hypothesis for how flight evolved in birds?
5. Why did Ken Dial's studies of birds called chuckers lead him to believe that flight developed from the ground up?

6. Larry Martin and David Burnham (University of Kansas) made their 3-D model of microraptor from a mold of a single microraptor fossil. How was the hip joint of model configured, and what does this suggest about microraptor and the origin of flight?

7. The team from the American Museum of Natural History made a sculpted model of microraptor from measurement of several fossil specimens. How did the configuration of the hip joint in their model differ from the of the University of Kansas team? What does this suggest?

8. Think about the two models of microraptor made by the teams at the American Museum of Natural History and the University of Kansas. Which do you think is a better model? Why?

9. What did the wind tunnel experiments at MIT show scientists about the way microraptor could have flown?