Name: ____ AM MID PM

Article of the Week for the Week of October 2, 2017
Due Friday, October 6, 2017

_______/20 points

1. Read the article and **diffuse** the text. (4 points)
    a. Underline any unfamiliar words
    b. Use context clues to help find the meaning
    c. Think of two possible substitutions (synonyms) for **at least two** unfamiliar words
2. Read again. Write **3+** thoughts in the margin to show your thinking while you read. (6 points)
3. Read a third time and take notes on who, what, where, when, and why on the back of this paper. Write a **5 - 7 sentence** paragraph **summary** of the article on your own paper. Staple that paper to this AoW. (10 points)

Shedding Light on the Dinosaur-Bird Connection

American Museum of Natural History, *ReadWorks.org,* No date given

When people think of dinosaurs, two types generally come to mind. There were the huge herbivores, like Apatosaurus, with their small heads and long tails. There were also those fearsome carnivores, like Tyrannosaurus rex, that walked on two legs and had a mouthful of teeth like kitchen knives.

Living Dinosaurs

These large dinosaurs are no longer around, but dinosaurs still live among us today. They are the birds. It's difficult to imagine that a bird on your window sill and a T. rex have anything in common. One weighs less than a pound. The other was the size of a school bus, tipping the scales at eight tons. But for all their differences, the two are more similar than you might think. In fact, birds and T. rex are close relatives. They all belong to a group of dinosaurs called theropods.

Finding the Evidence

To better understand the link between non-bird dinosaurs and birds, scientists look for features they share. When studying living birds, they can observe their behavior and study their anatomy. It's a different story altogether when it comes to long-extinct dinosaurs. Behavior cannot be observed, and all that's left of these animals are the clues found in ancient rocks. This evidence includes fossilized bones, teeth, eggs, footprints, teeth marks, and even dung.

Skeletal Evidence

When paleontologists compare a skeleton of a living bird to the fossilized skeleton of a non-bird theropod, like Sinornithosaurus, they see many similarities. They both have a hole in the hipbone, a feature that distinguishes most dinosaurs from all other animals. This feature allows an animal to stand erect, with its legs directly beneath its body. All theropod dinosaurs, including birds, have a furcula, also known as a wishbone. Another shared characteristic is the presence of hollow bones. Hollow bones reduce the weight carried by an animal. This feature enables the animal to run faster. It probably also played a role in the evolution of flight.

Behavioral Evidence

Birds build nests, lay eggs, and brood their nests. When scientists look at some non-bird theropod fossils, they see evidence of these same behaviors. The first discovery of this evidence was in 1993 in the Gobi Desert in Mongolia. Scientists unearthed a Citipati fossil brooding a cluster of eggs. Its limbs were folded back against its body. It is one of the few fossils ever found that demonstrates behavior. In this case, parental care. It shows that the behavior of brooding the nests that we see in living birds was already present in the non-bird ancestors of birds.

Citipati, like many other non-bird dinosaurs, had feathers. Yet it could not fly. Feathers were once thought to have evolved for flight. The discovery of more and more non-flying dinosaurs with feathers disproved that explanation. For these dinosaurs, feathers may have served other functions, like gliding, insulation, protection, and display. Feathers play that same role in many bird species today.

Based on the evidence of shared characteristics, scientists have concluded that birds are a type of theropod dinosaur.

Brain Evidence

Birds are the only dinosaurs with the ability to fly. This is very interesting to scientists who want to know when the capability of flight emerged. To find out, some scientists study the brains of bird and non-bird dinosaurs. Soft tissue, such as brains, is almost never preserved in the fossil record. What is preserved is the imprint the brain left on the inside of the skull. Now scientists are using computed tomography (CT) scanners to create endocasts. These are detailed, three-dimensional reconstructions of the interiors of fossilized skulls.

In a recent study, researchers were able to peer inside the braincases of more than two dozen specimens. “Technology allows us to look inside these specimens without destroying them,” says Dr. Amy Balanoff, a Museum research associate. “It’s a non-destructive way to basically slice up a dinosaur brain. We look inside and see what it can tell us about the evolution of the brain within dinosaurs. Most of us grew up thinking that dinosaurs had tiny brains, but actually some had really big brains.”

The endocasts allow Balanoff and other researchers to explore the outer shape of the brain in more detail. In addition, the casts also provide new information about the volume and shape of different regions of the brain. For example, scientists looked at a detailed view of the dinosaur cerebrum, a region of the brain related to cognition and coordination. They found that this region was very large in non-bird dinosaurs closely related to birds. Dr. Balanoff’s research suggests that these dinosaurs developed big brains long before flight and that these bigger brains prepared the way for them to fly.

When examining skeletal, behavioral, and brain evidence, scientists see that birds and non-bird dinosaurs share many features. This helped them conclude that dinosaurs aren’t extinct after all. They’re living among us today.

Who -

What -

Where -

When -

Why -