

Article-Based Questions

Directions: After reading the article “Color me dino,” answer these questions:

1. Using the article, define the term *paleo color*. What do you think paleontology means based on your answer?
2. The article mentions that microscopic structures have been found inside fossilized skin and feathers. What did scientists first think about the identity of these structures?
3. How did Jakob Vinther and his colleagues explain the microscopic structures found in a 125-million-year-old fossil feather? Define the term for these structures and state what type of information they provide scientists.
4. According to the article, what is the significance of determining the true identity of the microscopic structures found in these fossils?
5. Scientists are still debating the identity of the microscopic structures. State an additional test that was suggested to provide new data about the debated topic. Name a challenge of using that test.
6. Explain the techniques Jakob Vinther’s team used to make suggestions about possible *Psittacosaurus* habitats.
7. Come up with a #hashtag that summarizes this article and send it to @ScienceNews. Include the second hashtag #SNHSDinos so your class can track each other’s ideas and vote on the best one.

Responses to Article-Based Observation

1. **Using the article, define the term *paleo color*. What do you think paleontology means based on your answer?** Possible student response: *Paleo color is the study of pigmentation from fossilized remains and what that pigmentation can reveal about how ancient animals lived, behaved and interacted with their surroundings. Paleontology is the study of fossilized remains to determine characteristics of past organisms and environments.*
2. **The article mentions that microscopic structures have been found inside fossilized skin and feathers. What did scientists first think about the identity of these structures?** Possible student response: *These structures were thought to be the remains of bacteria and maybe bacteria that decomposed the deceased animal.*
3. **How did Jakob Vinther and his colleagues explain the microscopic structures found in a 125-million-year-old fossil feather? Define the term for these structures and state what type of information they provide scientists.** Possible student response: *Jakob Vinther and his colleagues proposed that the microscopic structures were melanosomes. Melanosomes are structures that produce and store melanin pigments. The shape of the melanosome is linked to the color in birds and mammals.*
4. **According to the article, what is the significance of determining the true identity of the microscopic structures found in these fossils?** Possible student response: *If these structures are melanosomes, they will be interesting for the field of paleo color. If dinosaur pigmentation and patterning can be determined, then scientists could infer quite a bit about the life of dinosaurs, including clues about behavior, habitat and evolution.*
5. **Scientists are still debating the identity of the microscopic structures. State an additional test that was suggested to provide new data about the debated topic. Name a challenge of using that test.** Possible student response: *One additional test mentioned in the article was to look for signs of bacteria using pyrolysis gas chromatography-mass spectrometry. But the technique destroys the sample.*
6. **Explain the techniques Jakob Vinther's team used to make suggestions about possible *Psittacosaurus* habitats.** Possible student response: *The researchers made a model of *Psittacosaurus* with the coloration patterns they expect from their examination of melanosomes in the fossil. They also made a gray model of *Psittacosaurus* and photographed it under various lighting conditions – inverting the coloration to create the optimal camouflage pattern for those conditions. Comparing the fossil coloration to the optimal camouflage patterns created with the gray models allowed the researchers to infer a possible habitat for *Psittacosaurus*.*
7. **Come up with a #hashtag that summarizes this article and send it to @ScienceNews. Include the second hashtag #SNHSDinos so your class can track each other's ideas and vote on the best one.** Possible student response: *#pigmentsmakepaleocolorpossible??*