

Name _____ Date _____

Pterosaurs: Observations And Hypotheses

Read the National Geographic news article online from April, 2009, "Giant Pterosaurs Couldn't Fly, Study Suggests." Use the definitions below and information from the article to determine observations and hypotheses about giant pterosaurs. For questions 1 and 2, answer questions below each of the quotes from the article.

observation *noun* data collected by using senses, such as sight, or an instrument, such as a ruler or thermometer.

hypothesis *noun* a possible explanation for a set of data. A requirement of a hypothesis is that it is testable using the scientific method.

scientific method *noun* a method of research in which a question is asked, data are gathered, a hypothesis is made, and the hypothesis is tested.

1. *Animals heavier than 90 pounds (41 kilograms) with wingspans greater than 16.7 feet (5.1 meters) would not be able to flap fast enough to stay aloft...in an environment similar to the present.*

a. What parts of this statement are based on observations? _____

b. What is the proposed explanation, or hypothesis? _____

2. *Giant pterosaurs, colossal winged reptiles that lived alongside the dinosaurs, have long been considered the heaviest animals ever to [fly].*

a. What parts of this statement are based on observations? _____

b. What is the proposed explanation, or hypothesis? _____

3. Is it possible that the statements above both include hypotheses, even though they provide two completely different explanations based on the same pterosaur fossil? Explain.

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4. Describe the observations Researcher Sato made before arriving at his hypothesis.

5. Which of these responses to Sato's hypothesis are observations, and which are hypotheses? Label each.

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| _____ | a. ...Sato's findings don't really apply to pterosaurs or even to all birds. |
| _____ | b. Argentavis, a giant bird, had a wingspan of 20 feet (6 meters). |
| _____ | c. Argentavis... seems to have been able to fly. |
| _____ | d. ...giant pterosaur fossils all seem to have extraordinarily thin bone walls. |
| _____ | e. ...giant pterosaurs might have been lighter than their size would suggest. |

6. Explain your decision about whether statement (e.) above is an observation or hypothesis. How did you make that decision?

7. How do you think the following hypothesis by Sato might be tested?

But if pterosaurs really were capable of sustained flight, 'we must think about the possibility of drastic change in other environmental factors, such as much lighter gravity or much denser air over geological time.'

8. The American Association for the Advancement of Science states that "hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations." How might this apply to our understanding of pterosaurs?
