

Name: _____

Date: _____

Period: _____

Reconstructing a Fossil Pterosaur

Background:

Imagine looking up to see a fur-covered creature gliding through the air on wings longer than the wings of a small airplane. This creature, a *pteranodon* (tə ran'ə don'), might have been a common sight during the Cretaceous, soaring from cliffs on its graceful sail like wings. The pteranodon belonged to a group of animals called *pterosaurs* (ter'ə sorz'), which means flying lizard. The giant pteranodons shared the skies with many smaller-winged pterosaurs. One such pterosaur, *Scaphognathus crassirostris* (skə fəg'nə thəs kras'i ros'tris), was about the size of a large bat. The bones of this pterosaur, shown below, were discovered in the early 1800s by the German scientist August Goldfuss. Notice the long, rounded jaw and beak of this animal. The animal's name is actually a description of its distinctive head: *Scaphognathus* means "boat-shaped jaw;" *crassirostris* means "large beak." In this laboratory you will use the method used by scientists to learn about now extinct vertebrates. You will put together - or reconstruct - a life-size model of the skeleton of *S. crassirostris*. Using evidence from the reconstructed skeleton, you will infer some habits and adaptations of this pterosaur.

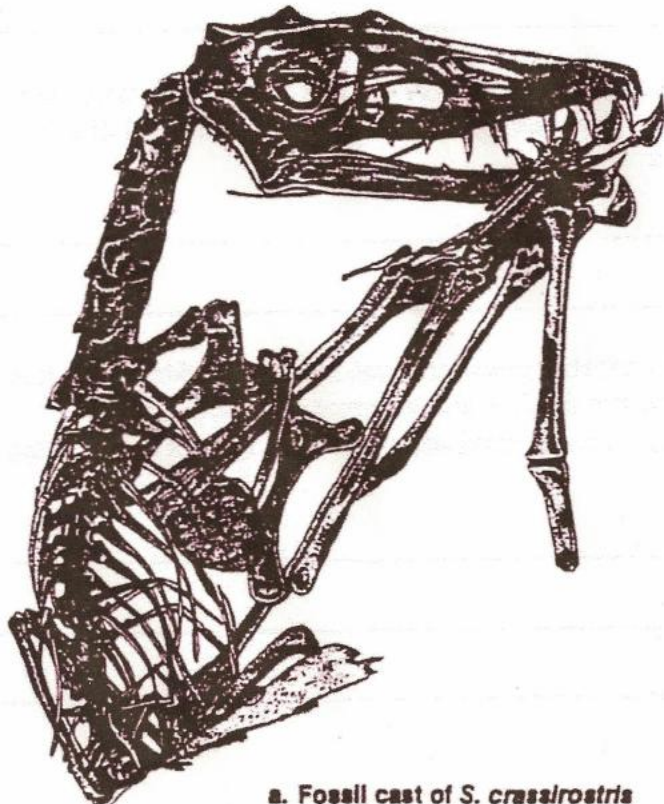
OBJECTIVES

- Reconstruct the skeleton of *S. crassirostris*.
- Make inferences about the mode of locomotion, feeding habits, and adaptations of *S. crassirostris*.

MATERIALS

Metric ruler
Scissors
Transparent tape

Procedures



a. Fossil cast of *S. crassirostris*

1. Illustration a is a picture of the fossilized bones of *S. crassirostris*. The bones are shown as they were found in a limestone quarry in Germany in the year 1826. Notice that most of the bones are unbroken. Observe that a few bones have changed orientation in the skeleton since the animal's death. For example, locate the rib that moved away from the animal's ribcage to become fossilized underneath the head. Identify other bones, and note their arrangement and orientation.
2. Cut out the drawings of *S. crassirostris*'s bones that appear on page 75. These bones are about the same size as the fossil bones found in Germany.

Illustration **a** is a reduction of the original fossil cast.

The upper arm bones make up the upper half of the wing. The little finger bones support the extension of the wing to the tip. The bones of the other four fingers protrude from the upper edge of the middle of the wing.

3. Using a as a reference, make a model of the skeleton of *S. crassirostris* from the cut-out bones. Find the two bones that make up the skull. Position these bones above the set of bones that make up the long, curved neck. Find the pieces that make up the backbone and ribs. Identify the shoulder blades and pelvic bones. Arrange these pieces to make the trunk. *S. crassirostris's* legs were short compared to its arms. Unlike other vertebrates you may be familiar with, the upper and lower parts of the leg were each composed of a single bone. The lower arm bones, however, were composed of two long, fused bones. The hands were much bigger than the feet. *S. crassirostris* had five fingers on each hand. When *S. crassirostris* was in flight, four of the fingers protruded from the middle upper edge of the wing. The remaining set of long finger bones extended from the four protruding fingers to the wing tip. The bones of this fifth finger were the main support for the lower extension of a wing. Find the two pieces that make up the hand. Note how the arm bones and hand bones fit together to make up the wings. Arrange the limb bones off the trunk. Fasten the bones of the skeleton model of *S. crassirostris* in position with tape. What was the approximate wingspan of *S. crassirostris*?

(a) _____

Analysis

1. What is the main function of the bones that make up *S. crassirostris's* little finger?

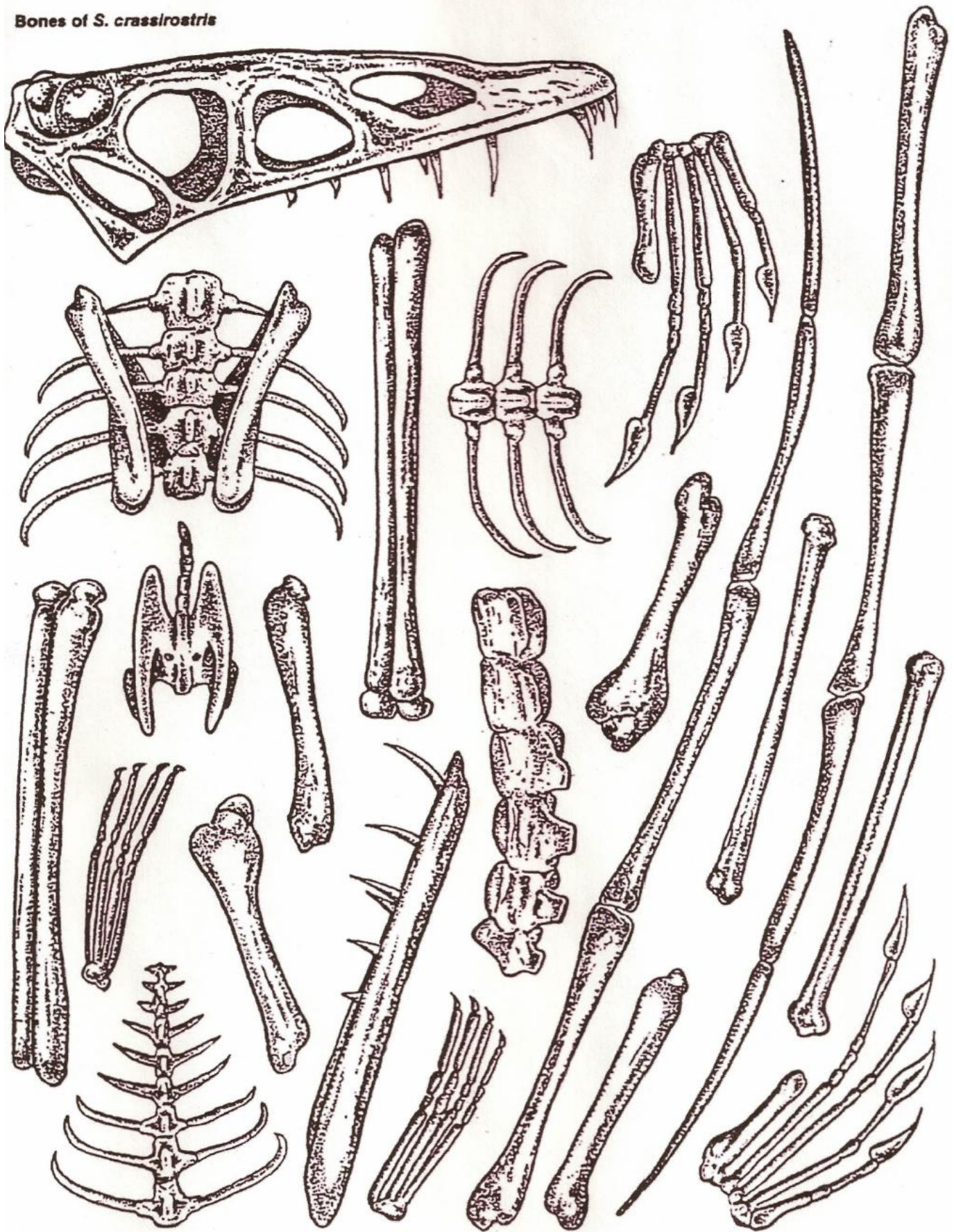
2. List three features of *S. crassirostris's* skeleton that imply that the animal was adapted to flying.

3. The fossil of *S. crassirostris* was found in limestone that formed in a warm seawater lagoon. What could you infer were the feeding habits and food of this animal? Explain your answer.

4. *S. crassirostris's* wings were probably made of a delicate flap of skin. If this flap of skin tore, the animal could not fly. Use this information to explain how *S. crassirostris* might have had trouble competing with bird species living during the Mesozoic era.

Even if a bird loses a large number of feathers, the bird can usually still fly. Also, feathers grow back fairly quickly; torn skin takes a long time to heal.

Bones of *S. crassirostris*



The protruding fingers of the middle of the wing might have been used to clutch the edges of the cliffs from which the pterosaur glide