

Animal Hands

Identifying x-rays from the zoo



Homologous means “agreeing” in Greek.

🔗 File/Open.../📄 Open Samples

- You may want to look at a picture of each of these animals.

Morphology means “shape study” in Greek.

x-ray #	description	function	animal
01			
02			
03			

Hints

- The size of each x-ray is not related to the size of the animal.
- The heavier an animal is, the thicker its bones are. This is a sign that they support weight.
- Macaques and humans are both primates, but macaque hands have more padding for swinging on tree branches.
- The macaque has a broken ring finger.
- Bird bones are difficult to see in x-rays because they are very thin and light.
- Humans have longer thumbs than baboons.
- Pandas appear to have five fingers and a *thumb*. This false thumb is an extension of one of their wrist bones. Pandas use it to strip leaves from bamboo, their main food source.

Many animals share similar body structures. For instance, your nose, a pig’s snout, and an elephant’s trunk can all be called *noses*. Though these noses have different functions and appearances, all have a similar location and structure. Such similar features are called *homologous structures*.

📄 Open the x-ray images 01 through 10 + Mystery Animal

📄 Briefly examine each image.

These x-rays show the *hands* of the following animals:

baboon	beluga whale	human	hyena
lion	macaque	owl	panda
sea lion	sun bear	zebra	

A structure’s shape is often related to its function. A hand used for swimming (a fin) is shaped differently than one used for supporting an animal’s weight as it walks. Likewise, a hand used for flying (a wing) is shaped differently than one used to manipulate objects and use tools.

Examine these x-ray images of animal hands in more detail and compare their structures. Based on the *morphology* of each hand, figure out its main function and determine its owner.

1. Make a table like the one shown at right to record your observations of the ten hand x-rays.

📄 Enhance the features of the animal hands. You may want to use some of the following techniques, or any others you have learned:

To use this technique...

...do this

invert the image

Edit/Invert

select color tables

Image/Lookup Tables ▶

To use this technique...

...do this

adjust Brightness and Contrast

Image/Adjust .. Brightness/Contrast

2. Briefly describe the main features of each hand. Here are some clues:

- Does the hand appear to have individual fingers?
- Does the hand show fingernails or claws?
- Are the bones thick compared to their length?
- Can you tell the shape of the flesh covering the bones? If so, describe it.

3. In your table, state the function you think that each hand serves (swimming, supporting weight, manipulating objects, etc.).

4. Based on the structure and function of each hand, tell which animal it belongs to.

More exploration

- Identify the Mystery Animal. On what do you base your identification?
- On the sea lion, zebra, and human images, what are the main differences between the three hands? What do they all have in common?
- Based on your observations, describe what you would expect x-rays of other animals' hands to look like, for example, a bat, chicken, cat, elephant, anteater, etc.
- Research the behavior of one or more of these animals to find out what other functions their hands serve.