

## Measuring Animals

One of the most common questions asked about animals is “how big do they get?” Answering this question is not as easy as you may think. Understanding the full range of sizes a species can reach requires studying a lot of individuals.

This type of study can be difficult for animals that live in the ocean, underground, and are generally hard to find. This is one way that zoos and aquariums can be helpful for researchers. Because we can house and care for a variety of animals, especially over a period of time, they are much more accessible to study and learn more about their growth.

At the Aquarium, we are assisting researchers by taking morphometric measurements of some of our animals. Morphometric measurements look at the external size and shape of an animal, and can vary depending on which animal it is. Some common measurements are the weight, total length, and girth, but others can be specific, such as beak length in birds, fluke width in cetaceans, and fin base in fish.

Our sea lions, sturgeon, and turtles are regularly measured and recorded, and these measurements are added to databases to support an overall understanding of these species. From this data, researchers gain a better understanding of growth rates, ages based on size and conditions, and determine proper dosages for medication.

### Activity: Measure the teddy bear!

You can practice being a researcher at home by studying your stuffed animals. Find your favorite teddy bear, take some measurements, then share them with us!

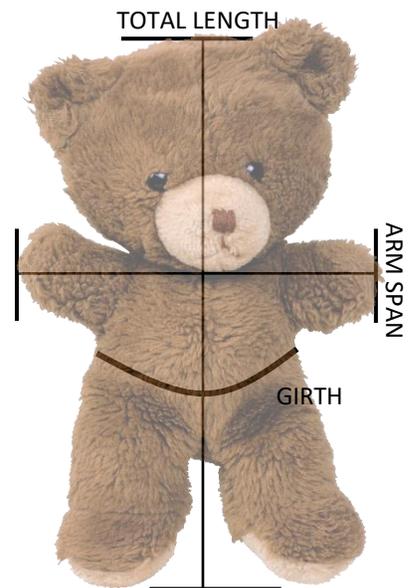
Materials:

- Favorite stuffed teddy bear, and other bears if you have them
- Measuring tape with centimeters
- Pencil
- Paper or printed tables below

Instructions:

1. Lay your bear specimen out on a table, face up.
2. Using the measuring tape, measure in centimeters the total length, arm span, and girth of your bear. The diagram at right will help you to determine exactly where you should be setting up your tape.
3. Write your results in the table below.

Total length (cm.)	
Arm span (cm.)	
Girth (cm.)	



4. If you have more than one teddy bear specimen, you can measure each one the same way as the first and add them to the following chart.

	Bear 1	Bear 2	Bear 3	Bear 4	Bear 5	Averages
Total length (cm.)						
Arm span (cm.)						
Girth (cm.)						

5. After you have measured all your bears, or up to 5 specimens in the table, you will calculate the average total length, average arm span, and average girth for this stuffed animal species and write that in the last column of the table. To calculate an average, you add the all the measurements for a category together, then divide by the number of specimens. For example:

$$\text{Average total length (TL)} = \frac{\text{TL Bear 1} + \text{TL Bear 2} + \text{TL Bear 3} + \text{TL Bear 4} + \text{TL Bear 5}}{5}$$

6. Once you have calculated all the averages, share them with us! Add them as a comment on today's Facebook Live video so we can all see what sizes of bears are out there. We will then be able to get a better understanding of how big the teddy bear species really is!

Discussion questions:

- Did you have any really big or really small bears in your group? Did this affect your average much?
- What other morphometric measurements could you take on the teddy bears to better understand this species size?
- Do you have another stuffed animal species that you could do a morphometric analysis on, like the one we did above? If so, what measurements would you take?
- When scientists discover a new species, whether it is a fossil or a live animal, do we really understand how large an animal can grow if we have just one specimen?