

## Size of large animals

I want you to consider the physics of larger and larger animals. What should one expect as animals get larger and larger.

If you double the size of an animal.

Supporting mechanisms ( like legs) area goes as distance squared, while volume goes as distance cubed.

So double the size, the area would be 2 squared larger ( $\pi r^2$ ) or 4 times larger.

The volume would be 2 cubed larger ( $\frac{4}{3} \pi r^3$ ) or 8 times larger.

So, double the size of an animal, the supports could hold 4 times as much weight. But, the animal would weigh 8 times more. These numbers are estimates, or approximates, but the ideas work.

So, as animals get larger, they can be stronger, but the added weight would dominate. So they would be slower and clumsier. A couple of thoughts to consider:

1. How large could one expect animals to get. Or are there any animals larger than an elephant? IF there were, what would they be like? What happened to the dinosaurs?
2. What would be the ideal size for an animal in terms of health, speed, and mobility?

Note, there are no absolutely correct answers to these questions, but the effects can be seen as animals get larger and larger.