

Hominid Evolution in Review

Although bigger brains are known to be related to higher intelligence in a general sense, bigger individuals within a species that obviously have a bigger body size aren't smarter than their smaller-headed companions. Brain size has intraspecific (within species) variation. When comparing various species, a significant aspect to study is **relative brain size – brain size compared to body size.**

To determine the significance of this correlation, we can gauge the ratio of brain size to body size. The chart below provides you with data on average cranial capacity (cc) and average body weight for several species. It is up to you to calculate the ratio by dividing the cranial capacity by body weight. Obviously, a species with a value of .05 has a smaller relative brain size than one with a 0.12 value.

$$\frac{\text{cranial capacity (in cubic cm)}}{\text{body weight (in kg)}} = \text{brain/body size ratio}$$

Fill out the chart for the following species listed.

Species	Cranial Capacity (cc)	Average Approximate Body Weight (kg)	Brain/Body Size Ratio
Chimpanzee	395	54	
Gorilla	506	120	
<i>A. afarensis</i>	438	37	
<i>A. africanus</i>	440	35	
Robust australopiths	515	39	
<i>H. habilis</i>	631	42	
<i>H. erectus</i>	985	56	
<i>H. sapiens</i>	1325	63	

1. Looking at your completed chart, is this what you would expect? From what you have found among the hominid species listed in the chart, at what point in human evolution did the most significant increase in relative brain size occur? (Do not include the non-human primates—look specifically at the hominids)

2. Based on what you have read, what behavioral adaptations or innovations accompanied these increases? (Be sure to indicate which hominid exhibited these behaviors)

3. List at least three features that are characteristic of australopithecine skulls.

a.

b.

c.

4. Name three *trends* that occurred *over the course of human evolution*. These could have to do with skull shape, facial morphology, or tooth and jaw proportions and would best be represented by fossil hominids belonging to the genus *Homo*.

a.

b.

c.

5. Drawing on your notes, readings, labs and any other resources, answer the following questions about hominid evolution. Which of the following “inventions” was first used by which hominid?

a. Walking bipedally_____

b. Burying their dead_____

c. Use of Acheulean tools_____

d. Control of fire_____

e. Use of Oldowan tools_____

f. Use of Mousterian tools_____

g. Use of symbolic images painted, sculpted, or engraved_____

h. Migrating out of Africa_____

i. Incorporating meat into diet_____