Name(s):		Period:	Date:

HASPI Medical Biology Lab 20
Evidences of Evolution
Lab Answer Sheet

Health and Science Pipeline Initiative

Station 1. Disorders in the Fossil Record

1. How can the fossil record provide evidence for evolutionary relationships?

2. Read and summarize the article "*Ancient Tuberculosis Found In 500,000-Year-Old Fossil*."

3. How can this find provide us with information that is useful today?

4. Read and summarize the article "*Making Sense of Homo floresiensis: Small-Bodied Humans, Dwarfism, or Disease?*"

5. How can this find provide us with information that is useful today?

6. Read and summarize the article "*Modern Cancer Type Found In Neanderthal Remains*."

7. How can this find provide us with information that is useful today?

Station 2. Comparing the DNA Sequence of Hemoglobin

1. Explain how comparing DNA sequences can provide information about evolutionary relationships.

2. Make a hypothesis about which animal's hemoglobin DNA sequence will be most closely related to humans? Which will be least closely related?

Table 1. Comparison of Hemoglobin DNA Sequences to Humans		
Animal	**Number of Nucleotide Differences**	**Percent Similar to Humans**
Fish		
Mouse		
Chimpanzee		

3. Count the total number of human nucleotides, and use the following equation to calculate percent difference and percent similar:

$$\% \text{ difference} = \frac{\text{\# of different nucleotides}}{\text{total \# of nucleotides}} \times 100$$

$$\% \text{ similar} = \% \text{ difference} - 100$$

4. Which animal is most closely related to humans according to your results? Which is least related?

Station 3. Anatomical Similarities in Digestive Tracts

.How can comparing similarities and differences in anatomy provide evidence for evolution?

!.What groups did you decide to use to separate the digestive tracts? Why?

;.Do you think observation of anatomical similarities should be used alone to group organisms, or should DNA and/or amino acid comparisons also be taken into account? Which method do you think is more effective at establishing evolutionary relationships? Explain your answer.

∴.Staple the groups you created to this sheet before turning it in.

Station 4. Comparing the Amino Acid Sequence of Insulin

1. Explain how comparing amino acid sequences can provide information about evolutionary relationships.

2. Make a hypothesis about which animal's insulin sequence will be most closely related to humans. Which will be least closely related?

Table 2. Comparison of Insulin Amino Acid Sequences to Humans		
Animal	Number of Amino Acid Differences	Percent Difference
Dog		
Sheep		
Mouse		
Ape		
Horse		

3. Count the total number of human amino acids, and use the following equation to calculate percent difference:

% difference =   **x 100**

4. Which animal is most closely related to humans according to your results? Which is least related?

Station 5. Embryo Similarities

.What is an embryo?

!.How does embryology provide evidence for evolution?

Table 3. Embryo Similarities				
Early				
Mid				
Late				

;.Which stage of development was hardest to determine? Why?

∴.Which stage of development was easiest to determine? Why?

;.What percentage of embryos did you guess correctly? Why do you think this was a difficult activity?

).Looking at the early development stages, list 3 similarities in the structure of the embryos.