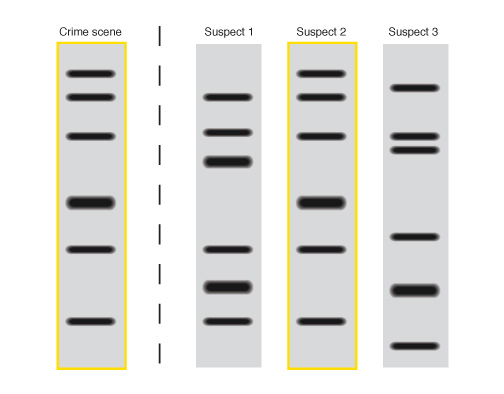
**Honors Biology Final Exam Study Guide**

1. While exploring space a Mars rover discovered an object/organism. Make a checklist of characteristics this object/organism must have in order to be considered living.
2. Why do organisms strive to reduce inter and intraspecific competition? Give one plant and one animal example.
3. How does diffusion differ from active transport? Is osmosis active or passive? What do diffusion, osmosis and active transport all have in common?
4. A seventeen year old student decides to have a clone created. How old will the clone be when it is created? Will the student and her clone look exactly the same? Why or Why not? (Are the same genes always expressed the same way?)
5. Considering the fact that sex is biologically expensive (50% dilution) why do so many organisms require sex for reproduction?
6. What is the difference between a somatic cell and a germ cell? If you wanted to mutate DNA in an organism and have it passed on to subsequent generations which type of cell would you manipulate? Why?
7. We all start as one cell. What is the term for the process of cells changing to perform different functions?
8. What is genetic engineering?
9. Sometimes a change in phenotype (directed by a change in genotype) can give an individual a reproductive advantage. What is the term for this and explain how it works.
10. For the most part the deeper you dig the older and more primitive life forms are. How does this support natural selection?
11. Mitosis and Meiosis – match the process with the description. A. .5 +.5 = 1 B. 1 = 2 Explain.
12. Where and when does meiosis take place in a human male. How about mitosis?
13. What is AIDS and why do people with AIDS often have problems with infections and diseases?
14. Where is DNA (genetic material) found in eukaryotic cells?
15. Genetic engineers will often cut portions of DNA out of a eukaryotic chromosome and splice it into a prokaryotic chromosome. How are they able to mix pro and eukaryotic DNA together. What tool do they use to cut the DNA?
16. Why would you feed a starving country grain rather than beef (Think second law of thermodynamics)? Why are there fewer tertiary consumers than secondary consumers? (Where does the energy go?)
17. Are there any organisms that can combine inorganic molecules and make organic molecules? If so give an example.
18. Most gasoline stations have small stickers on the pumps advising customers that the gas may contain up to 10% ethanol. Why would refineries add ethanol to gas?
19. Does the scientific method allow for revision? Why do we still use the scientific method is it sometimes produces questionable results?
20. What are the monomers of proteins? How about carbohydrates?
21. One benefit of a cell membrane is that it allows a cell to maintain an internal environment different from the outside. This may include different pH, solute concentrations or even temperature (for large groups of cells—organisms). What is the term for maintaining an internal balance?
22. Certain enzymes function best at certain temperatures. An enzyme active in humans might function best at 37 Celsius while thermophillic bacteria might prefer a much higher temperature. Regardless of temperature most enzymes function best at a small range of temperatures and lose the effectiveness as the temperature deviates from the optimal range. Why do enzymes become less effective outside of their optimal range?
23. What is old field succession? Either draw an example or describe one.
24. What are invasive (nonnative) species? Why are they often able to take over ecosystems?
25. Prior to the filming of “Finding Nemo” they tried a film called “Saving Ethel”. The plot was very similar. Ethel was caught in Spruce Run and taken to beautiful tank in an orthodontist’s office. Ethel escaped and was taken to the ocean by Seaside Heights, NJ. The outcome was not as happy as “Finding Nemo”. Ethel off the coast of NJ. Explain why Ethel died (think diffusion). Assume the trash and disease of Seaside Heights did not kill her.
26. It should be no surprise that chemicals in water can be absorbed by organisms and passed up the food chain. Often the level of the toxin increases up the food chain (biomagnification). Plot the following data. Explain how DDT was found in frogs.

|  |  |
| --- | --- |
| Year | DDT Concentration (ppm) |
| 1990 | 3.1 |
| 1991 | 3.8 |
| 1992 | 4.0 |
| 1993 | 1.9 |
| 1994 | 3.2 |
| 1995 | 4.2 |

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1. Do you think a Velociraptor is more closely related to a chicken or a leopard? Give supporting reasons/evidence.
2. Give an example of a producer and of a consumer.
3. Kudzu is an invasive vine found in the South Easter United States. Give one abiotic factor that might stop the northward spread of Kudzu.
4. What is competition? Give an example.
5. Batesian Mimicry is when a harmless species mimics the coloration of a venomous or more dangerous species. Where are instructions stored for the phenotype of an organism? Why would a harmless species want to look like a more dangerous one? How do predators learn to avoid venomous prey?
6. Give an example of using the scientific method. Be sure to correctly use the following terms: hypothesis, control group, experimental group, independent and dependent variables and data.
7. Food webs are incredibly complex. If at any level you remove a species there can be a ripple effect up and down the food web. Removing some consumers can limit available energy to all levels above the producers. Getting rid of top predators (apex predators) can also cause ripple effects in an ecosystem. What would happen in the Nile River if all of the crocodiles were removed?
8. Membranes are often selectively permeable. If a cell containing a 5% glucose solution is placed in a 3% glucose solution which way will water move? Assume the cell membrane allows water to move freely and does not allow the movement of glucose.
9. Given the following DNA sequence create the complimentary mRNA sequence (mRNA codons) and then create the amino acid sequence. TTA CGC GGA AAT
10. Given the following gel determine the guilty party.



Explain how you found the guilty suspect. How would the gel differ if this were a paternity case. In other words, if we had the DNA from several possible sperm donors and the child. Draw a gel for a hypothetical paternity case.