

# Difference between acclimation and adaptation biology essay



**ASSIGN  
BUSTER**

Adaptation for an animal is any genetically heritable trait that allows an individual to reproduce and pass on its genes. Example (Camels adapting to be able to survive long periods of time without water in the desert)

- Acclimation for an animal is the process by which an animal gets used to a changing environment. Example (If a deer lives in a forest, and one year that forest experienced a colder, then the deer would have to acclimate get used to the cold or move to a different forest) 10/10

### **List 5 protein types and their roles (functions) in organisms.**

Antibodies - defense

Motor / Contractile Proteins - provide help with movement

Structural Proteins - provide structure and support

Hormones - initiate chemical reactions

Enzymes - catalyze chemical reactions

Transport Proteins - Help transport substances across the membrane 10/10

### **List 3 significant differences between DNA and RNA.**

The secondary structure of DNA is a double helix, the secondary structure of RNA is a hairpin.

In DNA the 4 bases are Thymine, Adenine, Cytosine, Guanine, in RNA the 4 bases are Uracil, Adenine, Guanine, Cytosine.

The sugar in DNA is deoxyribose, the sugar in RNA is ribose 10/10

### **List 3 types of polysaccharides and their use in cells.**

Starch - used to store energy in plants

Glycogen - used to store energy in animals

Chitin - used to provide structural support for the cell wall of bacteria, as well as the exoskeleton of crustaceans and insects

Peptidoglycan - used to provide structural support for the cell walls of bacteria

Cellulose - used to provide structural support for the cell wall of plants 10/10

### **Give a detailed explanation of the two methods by which molecules move across lipid bilayers.**

Active Transport - Active transport describes when a molecule uses energy to cross a lipid bilayer

Passive Transport - Passive transport describe the movement of molecules across a membrane that does not require energy or ATP 10/10

### **For each of the following, tell whether the component is an organelle and briefly describe its function.**

Ribosome - not organelle (make proteins for amino acids are protein builders / synthesizers.

Mitochondria - organelle (produces ATP)

Lysosome - organelle (break up food, and other " particles" to make it easier for the body to digest the food or said " particles"

Vacuole - membrane bound organelle (digestion, and getting rid of waste)

Nucleus - organelle (stores genetic information) 10/10

### **Give examples of the diversification in animal development in the areas of feeding, movement and reproduction.**

Diversification in animal feeding = some animals like deposit feeders (sea cucumber, worms, etc) eat through the sediment that is around them to obtain their nutrition. Filter feeders (certain types of whales) filter through water in order to obtain tiny crustaceans like krill. Many types of insects use a proboscis to obtain food like nectar, Humans, and many other animals like deer, bears, lions, otters, snakes, some fish, etc. have the presence of a jaw which allows them to eat.

Diversification in movement = some animals like worms move with the a hydrostatic skeleton. Many other animals use the presence of limbs like legs, fins, tails, wings and other appendages to move. Other animals like snakes make coiling actions with their spine to propel themselves forward.

Diversification in reproduction = some animals reproduce asexually, some animals are able to reproduce by budding (sea stars), and other animals (humans, some fish, deer) reproduce sexually. 10/10

### **List the differences between protostomes and deuterostomes.**

Protosomes developed an anus first then a mouth

Deuterostomes developed a mouth first then an anus 5/10

## **What are coeloms, pseudocoeloms and hemocoels?**

Coelom = A fluid filled cavity within the mesoderm

Pseudoceoloms = An internal body cavity of some invertebrates.

Homocoel = A cavity or space in most arthropods and mollusks between the organs where the blood or fluid flows through or bathes the organs. 10/10

## **What is a hydrostatic skeleton and how does it work? Give one example of a specimen with a hydrostatic skeleton.**

- A hydrostatic skeleton is a "skeleton" that consists of fluid filled closed chambers, that generates movement as a result of muscle contractions.

Examples worms 10/10

## **Describe the process of natural selection as postulated by Darwin.**

- Darwin's process of natural selection basically said that animals and species who don't have certain heritable traits or are unable to adapt to their surrounding will die out and species who have certain heritable traits or are able to adapt will live and produce offspring with those heritable traits.

Natural selection doesn't affect the individual but the population. 7/10

**Discuss the concept of behavior in which an animal sacrifices itself for the “good of the species” in the context of natural selection. (i. e. Does such behavior fit into Darwinian evolutionary models? Why or why not? Can you give or refute examples of it? Is this consistent with evolutionary models?)**

I think this question can be best answered with another question. Can animals (besides humans) feel emotion? Does another animal feel compassion towards other members of it's herd enough so that's it's willing to sacrifice it's life? I believe the answer is yes. All mammals and most other animals have the natural tendency to protect their young and the young of the heard. For example in Africa when elephants are crossing the Serengeti and a young elephant is attacked by a lion or other predator, it is very common that many other members of the heard (not including his or her parents) will defend and in some cases die for that young elephant. We can also see this among dogs (whom I believe do have emotions for humans). In domesticated dogs there have been numerous incidents where the dog will defend their owners if they feel that their owner is threatened by another dog or what have you. This is because the dog feels the human as it's own family or heard and would in some cases die for the greater good of his heard (human family).

I personally don't believe that these examples don't fit into the Darwinian models, because there's no way to predict, or accurately count how many times an instance like this occurs. Darwinian evolutionary models show how animals adapt, die out, or reproduce depending on their surroundings.

Sacrificing yourself for the greater good of your species / heard / family does not fit into that model. 12/15

### **List the differences between mitosis and meiosis.**

Meiosis = 2 cell divisions, chromosomes are halved, results in 4 haploid daughter cells, synapsis of homologs, different identical make up of chromosomes in daughter cell

Mitosis = 1 cell division, chromosomes stay the same, results in 2 diploid daughter cells, no synapsis of homologs, identical make up of chromosomes in daughter cell 10/10

### **Asexual and sexual reproduction each have advantages and disadvantages. List one advantage and one disadvantage of each.**

The advantages of asexual reproduction are that it is more efficient than sexual reproduction. The disadvantages are that the offspring is going to have an identical genetic makeup which can possibly keep a bad gene in the in an offspring through generations of asexual reproduction

The advantages of sexual reproduction are that with sexual reproduction you will get a variation on the genes with each offspring depending on the maternal and paternal genes. The disadvantage is that it far less efficient than asexual reproduction. In most cases of sexual reproduction you have to attract / get the consent of the opposite sex to mate via (songs, fighting over with other animals, displays, etc.) 10/10

**Trisomy is the presence of an extra chromosome, while monosomy is the absence of a chromosome. Approximately 1 in 200 humans have a trisomic karyotype and about 1 in 5000 humans have a monosomic karyotype. What conclusions can you draw about the relative survivability of organisms with extra genes compared with those with missing genes? Explain why you think this would be so from an evolutionary prospective.**

- From the number you have given me it would appear that the relative survivability of an organism with a monosomic karyotype is much lower than those with a trisomic karyotype. A monosomic karyotype is 50 times less likely to occur than trisomic karyotype, which causes me to believe that people with a monosomic karyotype would die out more quickly or be less able to reproduce, there for causing the gene to be less frequent in individuals. The fact that monosomic is becoming less frequent in individuals shows me that people are evolving to combat the issue, or the gene is “dying” / fading out. 15/15

**The same genetic process is used to produce both sperm and egg cells, yet more than 90% of trisomies appear to be due to maternal errors. Give a hypothesis to explain why this might be so. How might one test this hypothesis?**

It's possible that there is a predisposition in all females that allow this error to occur. This could be similar to Turner Syndrome where the end results are always sterile females. My guess is that the reason 90% of trisomies appear to be maternal errors is there is something in the female body or a slight different in the way something is produced that causes this error. However since 10% would appear to be a paternal error, the cause for the error in



females must relate somehow the error in males. To test this hypothesis, I would run hundreds of tests in a laboratory to produce sperm and eggs and watch how each of them develop, exactly what goes into both of them, and see how they both develop under different conditions, and the exact conditions. From there I might be able to find the missing link to why this is happening. 15/15