NOTES #5 ASSIGNMENT – ANSWER KEY

Then use the information below to answer the 10 questions at the bottom.

Imagine one gene with two alleles – The gene is for determining the length of tail in a species of Wild hamster. One allele is dominant (long tail = L) to the other allele is recessive (short tail =l)

L = Long-tailed hamsters l = Short-tailed hamsters

* Keep in mind that if a Hamster has at least on "L" it has a long tail.
* Use the information below to complete the calculations required.

YEAR 1 – 15 hamsters YEAR 5 – 15 hamsters

LL ll LL

Ll Ll ll

LL LL ll  
  
ll LL Ll

LL Ll ll

Ll ll ll

LL ll ll

Ll Ll ll

ll ll LL

Ll ll ll

**Calculate the following:**

1. **What percentage of the Year 1 population of 15 Hamsters had a short tail?**

* **Only 5 out of 15 hamsters have a short tail = 33.3%**

1. **What percentage of the Year 1 population of 15 Hamsters had a Long tail?**

* **10 out of 15 hamsters have a long tail = 66.6%**

1. **In Year 1, there are a total of 30 alleles, what percentage of those alleles are "L"?  
   - The allelic frequency in year one for "L" allele is that 16 out of 30 alleles are "L" = 53.3% of the alleles are "L"**
2. **In Year 1, there are a total of 30 alleles, what percentage of those alleles are "l"?**

* **The allelic frequency in year one for "l" is that 14 out of 30 alleles are "l" = 46.7%**

1. **In Year 5, what percentage of the population of 15 hamsters had a short tail?  
   9 out of 15 hamsters have a short tail = 60%**
2. **In Year 5, what percentage of the population of 15 hamsters had a Long tail?  
   - Only 6 out of 15 hamsters have a long tail = 40%**
3. **In Year 5, there are a total of 30 alleles, what percentage of those alleles are "L"?  
   - The allelic frequency in year five for "L" allele is that 8 out of 30 alleles are "L" = 26.7% of the alleles are "L"**
4. **In Year 5, there are a total of 30 alleles, what percentage of those alleles are "l"?  
   The allelic frequency in year five for "l" is that 22 out of 30 alleles are "l" = 73.3%**
5. **Over this very short period of time, what trait is being selected for via Survival of the fittest?  
   The favoured trait due to natural selection is the SHORT Tailed Phenotype. The short-tailed allele is on the rise.**
6. **Suggest a possible explanation for why this trait in Wild Hamsters may be advantageous, use your creative brain?**

**Perhaps having a shorter tail makes it easier to completely hide in small spaces, whereas a longer tail may stick out and predators can pull you out of that hiding spot. Also, if both types of hamsters were equally fast, but a long tail was trailing behind one hamster, a predator may be able to snag your long tail.**