Name_____ Date _____

4.4 Unit 4: Inheritance; Worksheet 3
Inheritance and Evolution

Remember back to the Thirsty Bird lab on evolution. In addition to mouthparts, you also looked at bird color. Each bird either had two blue cards, two yellow cards, or a blue and a yellow card. If you had two blue cards, your bird was blue,or a yellow and blue card, your organism was blue.. If you had two yellow cards, your bird was yellow. Below is a sample of the some of the data obtained for 16 generations:

Generation	# of birds with 2 blue cards	# of birds with 1 blue and 1 yellow card	# of birds with 2 yellow cards	Total # of birds	# of blue cards	# of yellow cards	Frequency of blue cards	Frequency of yellow cards
1	7	13	6	26				
2	6	18	4	28				
3	9	12	7	28				
4	9	14	5	28				
5	10	13	3	26				
6	8	11	3	22				
7	6	8	4	18				
8	7	5	4	16				
9	9	4	6	19				
10	8	7	7	22				

Frequency = to percent as a decimal

1. Determine the number and frequency of blue cards present in every generation and write the result in the appropriate column in the above table.

2. Determine the number and frequency of yellow cards present in every generation and write the result in the appropriate column in the above table.

3. What do you notice about the number and proportion of blue cards as the number of generations' progresses?

4. What do you notice about the number and proportion of yellow cards as the number of generations' progresses?

5. What do the cards represent? Explain.

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6. Is blue or yellow dominant? How do you know?

7. What can you say happens to the frequency (proportion) of an allele in a population from generation to generation if there is no selective pressure? Justify your answer.

8. What do you think would happen to the frequency of the yellow allele if a predator started eating only yellow organisms? Explain.

9. How does this new information modify your model of evolution by natural selection?

10. **CHALLENGE**:
    i. If the frequency of the yellow allele is q and the frequency of the blue allele is p, express as a formula the frequency in the next generation of (Hint: this would be the same as calculating the frequencies)

        1. homozygous blue organisms
        2. heterozygous yellow organisms
        3. homozygous yellow organisms

    ii. Explain how you derived those formulas.

    iii. Check your work using 2 generations of data.