

Genetics Refresher: Mendel, Mutation, and Chromosomes in Heredity

Type all answers **in your own words!!!** You may also neatly draw well-labeled diagrams!!!

Chapter 2: Mendel

- 1) What was Mendel using Hieracium to study? Why was he unlucky?
- 2) What is Fisher's issue with Mendel's results? What analogy does Sturtevant (the author of this book) use to illustrate the issue?
- 3) What are 3 potential reasons that may account for the issue in question 2?

Chapter 11: Mutation

- 4) What was the first well-described example of synthetic induction of mutations? Who carried out the work? When was it done? How was it done (you can use other resources)?
- 5) Muller went on to make "two tentative suggestions." What were these suggestions? Are they still valid today? Who supported or debunked these assertions? What is the data to support their claim?
- 6) What new class of mutagen arose in the late 40's? What sparked its study? Why was its use in research delayed for so long?

The Chromosomes in Heredity

- 7) What is the concept of parental purity? Is this an accepted theory today? If so, what is it called, and if not, what is the accepted alternative explanation?
- 8) What is Sutton talking about on the last paragraph of page 8 (starts: "We have seen reason, in the foregoing considerations...")? Why is this particularly impressive?
- 9) What are Bateson's 3 cases of non-Mendelian inheritance? Describe them in your own words.
- 10) What is Sutton's key contribution to the world of genetics?

Genetic Refresher

- 11) Define the following common genetic terms (one sentence each):
 - a. Expressivity
 - b. Penetrance
 - c. Heterozygous
 - d. Homozygous
 - e. Epistasis
 - f. Pleiotropy
 - g. Linkage
 - h. Synteny
 - i. Aneuploidy
- 12) Consider color as a hypothetical monogenic trait in peas. For this question, peas can be yellow or green, and the green allele is dominant. If I cross a homozygous green (GG) plant with a homozygous yellow (gg) plant, what will be the genotype and phenotype ratios for the F₁ and F₂ generations?