

Extra Credit Reading*A FEELING FOR THE ORGANISM*

Name: _____

1. What organism did Barbara McClintock use to conduct her genetics investigations? What was her methodology?
2. Describe the problem that McClintock suggested Harriet Creighton solve. How did her findings correspond to what was discovered with *Drosophila*?
3. In the early 1930s, what similarities did McClintock and her colleagues find in the genes of plants and animals?
4. X rays produce mutagenic effects. What did X rays allow McClintock to determine about the chromosomes of maize?
5. Describe the relationship between embryology and genetics. Why was it important for scientists in the 1930s to integrate the two fields?
6. To what did McClintock equate the gene? How did her view differ from the views of other scientists?
7. What impact did World War II have on scientific research? How did the war affect McClintock's work?
8. Transposition is controlled breakage, or dissociation, in the chromosome. What was McClintock's initial conclusion about transposition? What did she still need to determine?
9. What was the scientific community's reaction to McClintock's findings about transposition? What were some reasons for this reaction?
10. What advantage did *Drosophila* have over maize in gene studies? What advantage did bacteria have over both *Drosophila* and maize in gene studies? What were the limitations to using bacteria?
11. Watson and Crick's discovery of the molecular structure of DNA was a revolution for genetics. What answers did it provide?
12. How did the attitude and methodology of molecular biologists change the study of genetics and cytology?

13. How did McClintock's individual methodology differ from that of other molecular biologists? What effect did this have on her ability to communicate the findings of her research?
14. What genetic rearrangements did molecular biologists identify that corresponded to the rearrangements McClintock had identified as a consequence of transposition in maize?
15. How did McClintock's experiences as a child and as a college student affect her lifelong work?
16. Three major research areas of 20th-century biology are heredity, development, and evolution. How did the relationship between these areas change?
17. How did scientists reconcile genetics and evolution?
18. What did McClintock mean by "understanding" the entire organism and her "feeling for the organism?"
19. Why did McClintock's thorough research techniques complement her "feeling for the organism?"
20. Describe the correlation between McClintock's scientific work and the work of an artist.
21. The central dogma, as put forth by Francis Crick, stated that "once [genetic] 'information' has passed into protein, it cannot get out again." What modifications did Jacques Monod and François Jacob make to the central dogma to account for protein variability?
22. Describe the process by which DNA dictates the construction of a particular protein.
23. Why was McClintock opposed to the use of models as scientific methodology?
24. Why did McClintock's "feeling for the organism" make it possible for her to achieve success in her scientific research?

25. Explain how genetic elements, known as transposons, jumping genes, or insertion elements, affect organisms.

26. Did you like this book? Why or why not?

27. What did you learn about the scientific process by reading this book?