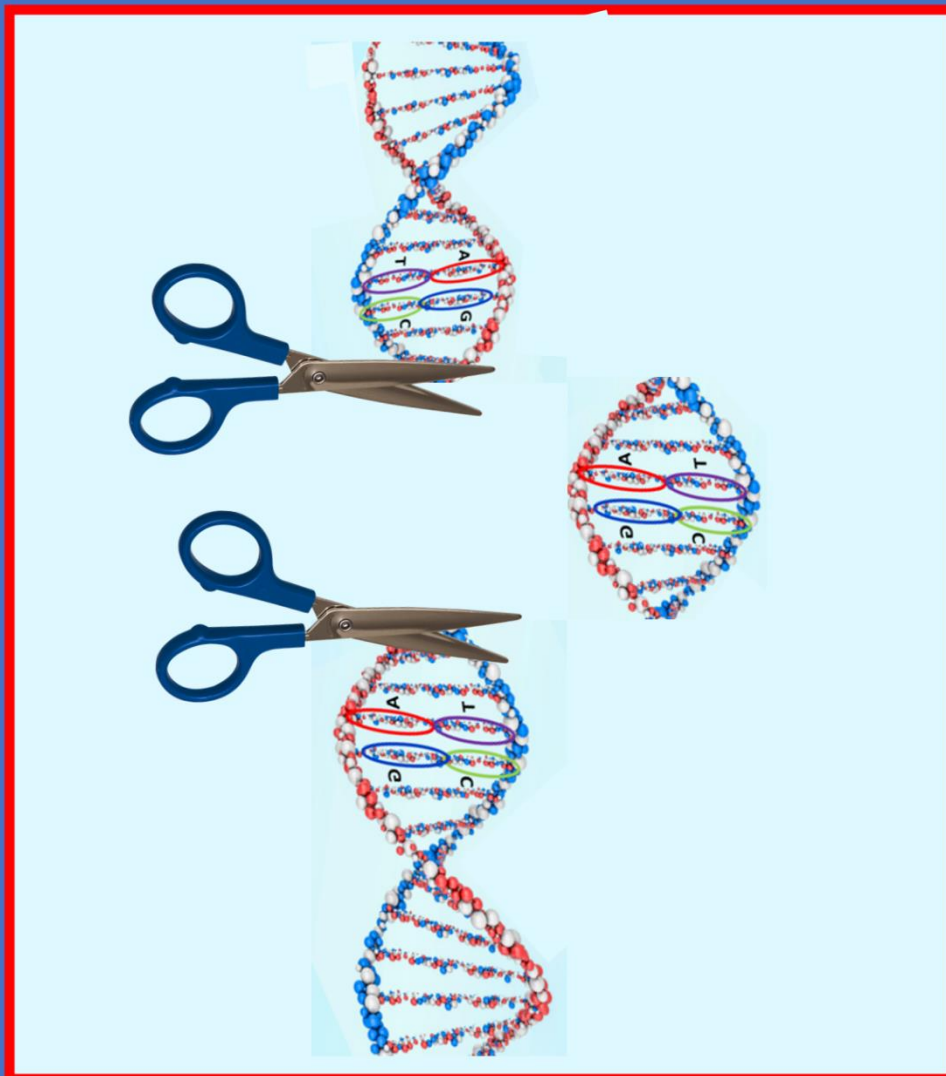


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The Billion Year-Old Scissors



GRANDPA'S QUESTIONS

THE BILLION-YEAR-OLD GENETIC SCISSORS

(AS ASKED BY GRANDPA)

1. What is a gene?
2. What information is contained in a gene?
3. How is the information in the gene written?
4. What is a genetic code?
5. What large molecule contains the genes?
6. What is DNA?
7. Describe the structure of DNA.
8. What is a cell?



QUESTIONS FOR THE BILLION YEAR OLD SCISSORS

9. Where in a cell is the DNA located?
10. What are bacteria?
11. Do bacteria have DNA?
12. What is the difference between bacteria and multicelled organisms
13. Can bacteria replicate themselves?
14. What are cyanobacteria?
15. What important function do cyanobacteria perform?
16. What is a virus?
17. Where is a virus genetic code written?
18. What is RNA?

QUESTIONS FOR THE BILLION YEAR OLD SCISSORS

19. How is RNA different from DNA?

20. What is a ribosome? Where are they located?

21. What is the special function of a ribosome?

22. What is a normal function of the ribosome factories in a human body?

23. What is an enzyme?

24. Describe how an enzyme used for digestion is produced in a human body.

25. What is messenger RNA (mRNA)? How is it involved in the cell's manufacturing process?

26. Do viruses attack bacteria? If so, how long ago did the attacks start?

27. How does a virus make copies of itself? Describe the process.

QUESTIONS FOR THE BILLION YEAR OLD SCISSORS

28. What do viruses do if they invade a bacterium?
29. Do bacteria have an immune system?
30. What does prokaryotic mean? What organisms are prokaryotic?
31. What did scientists find that was unique in prokaryotic bacteria?
32. What does CRISPR refer to? What does it mean? What do the letters stand for?
33. What did Francisco Mojica discover in the bacteria DNA about the SPACERS between the REPEAT sections?
34. What was special about the SPACER genetic code between the REPEAT sections? What did it have to do with the bacteria's immune system?
35. Based on its CRISPR genetic code, what two things could a bacteria do with an invading virus?

QUESTIONS FOR THE BILLION YEAR OLD SCISSORS

36. Why are the SPACERS in a bacterium DNA like mug shots of the virus?

37. What is CRISPR Cas9?

38. What functions of the bacteria immune system were used in the CRISPR Cas9 genetic scissors?

39. What can be done to DNA with the CRISPR Cas9 technology?

40. What is genetic engineering?

41. What are some applications of genetic engineering with CRISPR Cas9?

42. Is it possible to genetically engineer a baby to have blue eyes using CRISPR Cas9? If so, describe how it could be done.

43. How was genetic engineering used to develop the mRNA vaccines?

THE STARDUST MYSTERY PROJECT

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