

Beacon Biochemistry 10th grade Summer Reading Assignment

Read the following sections of Bill Bryson's "A Short History of Nearly Everything"

-ISBN # 076790818X (paperback) or any other format of your choosing.

-Intro, Chapters 1, 2, 5, 7, 9, 13, 16

General Questions – Answer all questions (General and Chapter specific) in full sentences, typed, double spaced and due on the 1st day of class.

1. How does a scientific discovery/theory relate to the discoveries/theories that preceded it? Does the new discovery/theory build on the old one? Does it completely replace the old one?
2. Many science textbooks start with a chapter describing THE scientific method. Based on the dozens of stories in this book, is there one scientific method? Did every scientist work the same way? Are there many similarities between the methods each scientist used? Some? None?
3. Humans are competitive. How has this competitive nature helped the progression of science? How has it hindered the progression of science? You should be able to find examples of both in this book.
4. What is the role of a scientist in promoting her own or his own cause? Should they be aggressive advocates, pushing their work no matter what? Or, should they let the scientific community decide on the importance of their work? Should the government or the general populace decide which scientific ideas or theories are to be supported?
5. The author is a master at numerical analogies. For example, on page 135 he notes that one atom is to the width of a millimeter line as the thickness of a piece of paper is to the height of the Empire State Building. How do these analogies help you learn the content they are trying to explain? Can you think of any others? Writing one of your own is great practice for proportional reasoning.

Chap 1

6. Describe the discovery of the cosmic background radiation. How does this radiation support the Big Bang Theory?
7. Some people claim the universe is "fine tuned" for our existence. What information from this chapter might someone use to provide evidence to support this claim?
8. J. B. S. Haldane once noted: "The universe is not only queerer than we suppose; it is queerer than we can suppose." What do you think Haldane meant by this? List two possible examples.

Chap 2

9. What are some characteristics of Pluto that may have led to its reclassification as a dwarf planet?
10. If the earth were reduced to the diameter of a pea, how large and how far away would Jupiter be? How large and how far away would Pluto be? The Exploratorium website is helpful for these questions.
11. What are some problems that must be solved before people can travel to Mars?
12. Why is it unlikely that aliens have visited Earth?

Chap 5

13. Explain the difference between catastrophism and uniformitarianism.

14. Charles Darwin once said that he didn't understand science until he studied geology. How was Lyell's way of thinking about *slow* geological change similar to ideas about evolutionary change developed by Charles Darwin twenty years later?

Chap 7

15. What is alchemy? How does it differ from chemistry? How is it the same as chemistry?

16. In what ways is the periodic table of the elements periodic?

Chap 9

17. Make an argument to support the statement that each one of us is billions of years old.

18. In what way is it correct to say that objects never really touch each other?

Chap 13

19. How many asteroids large enough to "imperil civilization" regularly cross the orbit of our Earth?

20. What is the K-T boundary? Why is it not called the C-T boundary?

21. Iridium is a very heavy element that is scarce in the Earth's crust. It is probably an important constituent of the Earth's core and perhaps also the lower mantle. Some geologists have argued that the iridium layer at the K-T boundary is volcanic in origin. How could volcanism create such an iridium-rich layer?

Chap 16

22. What are the four principal characteristics of Earth that lead to it being a habitable place for humans?

23. How does the molten interior of the Earth facilitate life on the surface of the Earth?

24. Make a 10-item shopping list of things you'd look for in a planet to determine if it would be habitable to humans.