IB PHYSICS

Name: _____

Period: _____ Date: _____

DEVIL PHYSICS

BADDEST CLASS ON CAMPUS

SUPPLEMENTAL READING ACTIVITY

Feynman Diagrams

1. Read the article, *"Physics and Feynman's Diagrams.pdf"* from the class website. This article relates to several key facets of IB Physics; the nature of science, development of science in a global community, the historical context of scientific inquiry and the ways of knowing. After reading the article, answer the following questions:
2. (___/1) According to the author, what is the difference between the work of experimental physicists and theoretical physicists? _____
3. (___/1) What, in the author's view, was Feynman diagram's contribution to the theoretical physicist's toolkit? _____
4. (___/1) What was Feynman's original purpose for his diagrams? _____
5. (___/1) What did Feynman diagrams do to facilitate computation? _____

6. (___/1) What is QED? _____

7. What were the two problems with QED calculations?
   a. (___/1) _____
   b. (___/1) _____

8. (___/1) What is a *perturbative calculation*? _____

9. (___/1) What are the two dimensions of the Feynman diagram? _____

10. (___/1) What are the rules for using Feynman diagrams? _____

11. (___/1) Why was the reception to Feynman's presentation at the Pocono Manor Inn less than enthusiastic?

12. (___/1) Who was most responsible for the spreading of Feynman diagrams and what did he do to gain their acceptance?

13. (___/1) What location became the most prominent training ground for post-doc theorists in the United States after the war? Who was its director?

14. (___/1) What evidence do we have that the Institute was responsible for the spread of Feynman diagrams?

15. (___/1) What impact did the Cold War have on the spread of Feynman diagrams to the Soviet Union?

16. (___/1) What was the main problem in applying Feynman diagrams to nuclear particles? _____

17. (___/1) What use did theorists have for Feynman diagrams when accelerators produced a "zoo" of new particles? _____

18. (___/1) What does the author mean by, "Thus it remains impossible to separate the research practices from the means by which various scientific practitioners were trained."? _____

Using the article as a backdrop, answer the following questions from a Theory of Knowledge and Nature of Science standpoint.

19. (___/1) What role does an expert play in helping to persuade us to believe something? _____

20. (___/1) What role do diagrams play in our understanding of new knowledge? _____

21. (___/1) In what ways, if at all, does math stimulate the production of new knowledge in science? ____

22. (___/1) Is a theoretical physicist really a scientist? _____

23. Answers may be typed or neatly printed. Drawings may be freehand, but try to make use of the 'Shapes' or 'Insert Clipart" functions of MS Word. You can then print your work and submit a hardcopy, or you can upload the assignment to Focus. If you choose this option, you must use a filename in the format, "LastnameFirstinitialPerXAsgnmtName". For example, "SmithKPerC34ReadActT9-3.doc"