Physics Reading #2 **Name** _____

Eureka: What Archimedes Really Meant **Date** _____ **Per.** ____

Relativity

1. Name the two "types" of relativity according to Einstein? _____

2. Briefly state the first conclusion from Einstein's special relativity.

3. Briefly state his second conclusion.

4. Explain the statement "How fast is the plane really traveling?"

5. Why is there no such thing as "absolute velocity'?

6. The speed of light is _____. And it is _____ miles per second.

7. Why is it that the velocity of the train plus your walking velocity will not equal the sum of those velocities?

8. What is meant by a "contraction of space and a slowing of time"?

9. Is the speed of light absolute? (yes/no)

10. Special relativity is rarely found in _____, hence the name. It deals with events that are viewed from two systems moving in uniform, constant, _____.

11. Einstein's paper on special relativity was published in _____. His work on general relativity was in _____.

12. General relativity extended special relativity to include all _____, even the ones that move erratically, elliptically, or with changing velocities.

13. Einstein stated that not only are time and distance relative to each other but _____ and _____ are relative also.

14. He also showed that laws of physics could be derived within any system. The ones mentioned above as well as acceleration and gravity and the qualities that depend on them, _____ and _____.

15. General theory gives us a realization that _____ is not independent of _____. That _____ looks and acts like a _____ dimension.

16. The above dimension can be warped by _____.

17. Space and time are _____ effects and not _____ of nature. Explain why.

18. $E = mc^2$ is only a small pat of _____ and one that Einstein didn't make a whole lot of fuss over.

19. The special theory says that physical laws must look the same to two observers in uniform motion. Among these laws is the law of _____.

20 Explain why velocities will look different to two observers.

21. Does light have mass (yes/no) Why?

22. Near the speed of light, all energy (force) goes into increasing the _____.

23. No matter how fast something is moving, its _____ can be translated into _____.

24. If we have a very small mass, say the size of an atom. And we can propel it to close the speed of light, we can therefore translate that into much _____.

25. Although Einstein didn't intend it, these theories gave us the ability to power entire cities or _____ them in an instant.