Notetaking Guide for Modern Marvels: Iron Date: _____

1. What is the most abundant stuff on earth? _____
2. Where are some places that iron is found? _____
3. How many electrons does iron have? _____
4. What happens when some of iron's electrons are shared between atoms?

   _____

5. What temperature breaks the electron bonds of iron? _____
6. What happens to the bonds when they are heated? _____.
7. Is iron endlessly recyclable? _____
8. How much of the earth's crust is iron ore? _____
9. What must be stripped off the top of the ore in open pit mining?

   _____

10. Where did iron come from? _____
11. How much of the earth's core is iron? _____
12. What is the chemical composition of iron ore? _____
13. What percentage of iron ore is magnetite? _____
14. What percentage of iron ore is hematite? _____
15. What color is hematite? _____
16. What color is magnetite _____
17. Why do the boulders need to be reduced to powder?

    _____

18. Why is iron made into pellets? _____
19. Why does the iron need to be 100% pure? _____
20. How do impurities get removed from iron? _____
21. How much carbon does it take to make steel? _____
22. How much stronger are the new enhanced and advanced steels?

    _____

23. Do the new steels weigh heavier? _____
24. What country produces more iron than the USA? _____
25. Historically, what products went hand-in-hand with the development of steel? _____
26. Historically, what was the source of the first iron used? _____
27. How did the ancient blacksmiths get their fires hot enough to purify iron?

    _____

28. What does the higher temperatures remove from iron ore?

_____

29. What is another name for the pure iron? _____
30. What technique changed weapons in the 16th century?

_____

31. How is cast iron formed? _____
32. What is the major problem with cast iron? _____
33. In 1856, what did Henry Bessemer discover? _____
34. How were the helmets of WWI formed? _____
35. What are the major alloys for the precise M-16 rifle barrels?

_____

36. What is the most curious property of iron? _____
37. Are super magnets permanent? _____
38. Are electromagnets permanent? _____
39. Is iron a vital mineral for humans? _____
40. How come iron doesn't turn to rust inside our bodies? _____
41. What is the major weakness of iron? _____
42. How many electrons orbit the iron nucleus farther away? _____
43. What molecule needs extra electrons? _____
44. How does iron oxide (rust) displace parent iron molecule?

_____

45. What is an industry that relies on iron oxide (rust)? _____
46. What percentage of iron is on Mars' crust? _____
47. Why are companies interested in mining Mars for iron? _____
48. What is the mother lode for iron? _____