When it comes to Kinetics, I can do all 45 of these things…

1. I can state relationship between temperature and reaction rate
2. I can state the relationship between surface area and reaction rate
3. I can write the formula to calculate rate
4. I can state the relationship between concentration of reactants and reaction rate.
5. I can define concentration and explain why higher concentration makes reactions go faster.
6. I can state the relationship between rate and time of reaction.
7. I can explain what an effective collision (as compared to an ineffective collision).
8. I can explain how catalysts make reactions go faster even though they do not increase collisions.
9. I can explain what a potential energy diagram shows.
10. I can tell you the 2 kinds of PE diagrams.
11. I can explain what potential energy is.
12. I can explain what the energy of the reactants is.
13. Skip this one.
14. I can explain what the energy of the products is.
15. I can explain what heat of reaction is, and the symbol for it is too.
16. I can explain what the activation energy is.
17. I can explain what the activated complex is.
18. I can explain why the ΔH can never change, even with a catalyst involved.

19. I can define entropy in 8 words (or less).

20. I can compare the entropy of 3 phases of matter.

21. I can compare entropy of 3 solids at the same conditions, but still know the highest and lowest entropy.

22. I can compare 3 solutions of the same molarity but still show why some have higher or lower entropy.

23. I can tell which of these reactions results in lower entropy (or higher entropy).
    A. $CO_{2(G)} \rightarrow CO_{2(S)}$
    B. $H_2O_{(L)} \rightarrow H_2O_{(S)}$
    C. $Ca_{(S)} + 2H_2O_{(L)} \rightarrow Ca(OH)_{2(AQ)} + H_{2(G)}$
    D. $NaCl_{(AQ)} + AgNO_{3(AQ)} \rightarrow AgCl_{(S)} + NaNO_{3(AQ)}$

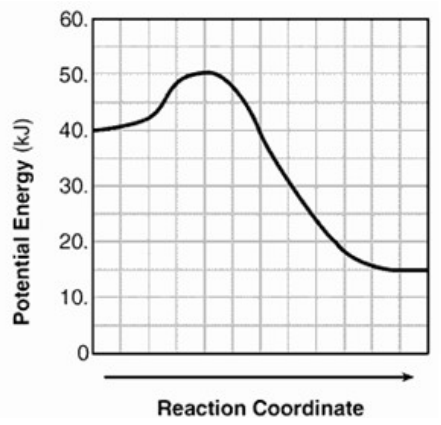
24. I can always explain melting ice results in (more or less) entropy.
    I can always explain the vaporization of water results in (more or less) entropy
    I can always explain the freezing of a liquid into solid results in (more or less) entropy
    I can always explain the condensation of a gas into liquid results in (more or less) entropy

25. I can explain that melting is an (endo or exo) thermic process.
    I can explain that freezing is an (endo or exo) thermic process.
    I can explain that vaporization is an (endo or exo) thermic process.
    I can explain that condensation is an (endo or exo) thermic process

26. I can explain which of these equations shows an increase in entropy (or a decrease).
    A. $CO_{2(G)} \rightarrow CO_{2(S)}$
    B. $CO_{2(L)} \rightarrow CO_{2(G)}$
    C. $CH_3OH_{(L)} \rightarrow CH_3OH_{(S)}$
    D. $CH_3OH_{(S)} \rightarrow CH_3OH_{(L)}$

27. I can explain what is meant by "when bonds form, energy is released", and tell how that statement impacts these kinds of bonds: hydrogen bonds, ionic bonds, or covalent bonds.

28. I could label the AE, AC, the ΔH, reactants, products, show a catalyst affect, and write in axis labels for a graph that looks like this, and write a good title for a graph like this one.



29. I can define dynamic equilibrium.

30. I can give a chemical reaction in dynamic equilibrium and I can use a common physical change that shows dynamic equilibrium.

31. I could write LeChatelier's Principle on a blank piece of paper if I wanted to. (you do)

If my example reaction is this: $2SO_{2(G)} + O_{2(G)} \rightleftharpoons 2SO_{3(G)} + 392kJ$

32. I can state that the forward reaction is (exo or endo) thermic.

33. I can state that the reverser reaction is (exo or endo) thermic.

I can determine the LeChatelier's Shift (forward or reverse) when these stresses are applied to this reaction…

$$2SO_{2(G)} + O_{2(G)} \rightleftharpoons 2SO_{3(G)} + 392kJ$$

34. add oxygen
35. add sulfur trioxide
36. add heat
37. add pressure
38. decrease heat
39. add heat
40. decrease pressure
41. add a catalyst
42. add sulfur dioxide

43. I can use this example from an old regents exam to state the obvious… $I + I \rightarrow I_2 + 146.3\ kJ$

44. I can use this other example to do the same… $Cl_2 + 242\ kJ \rightarrow Cl + Cl$

45. I can state that the Universe is tending towards __ energy and __ entropy. (use more or less in each dash)