Constructing Line Graphs – Appendix B
AP Biology Essentials

Directions: Reading, constructing and interpreting graphs are essential skills for any Biology/Science student. We will spend a significant time this year working with graphs. Please work through the following assignment, while carefully reading the handout entitled, ***Constructing Line Graphs*.** This does not need to be completed in complete sentences, **THIS IS FOR YOUR UNDERSTANDING AND USE**. I will simply review it for completion.

(Note: a '  ' after the question means that the answer is not found verbatim in the reading and that you may have to 'think' about it.)

1. What TWO pieces of information does each dot represent in Figure A3?

2. If the dots represents measurements that we made, what are the lines between the dots representative of?

3. In this line graph, is it possible to obtain a measurement/time, for which there is no 'dot?' _____

   How is this measurement denoted on the graph in A.3?

4. In addition to making the graph easy to read, what else may be the purpose of the line? 

5. In a line graph, one may only represent measurements actually observed with dots and solid lines. What is the purpose of the dotted line which is located between 040mg/3-5hrs in Figure A.3? What is this part of the line called?

6. How is an ‘extrapolation’ different from an ‘interpolation?’

7. Why must the reader of the graph be cautious about extrapolations?

Basic Requirements for a GOOD Graph!

8. Read over the suggested titles for the graphs on page A6, a-e. Why is ‘e’ the superior title? (You will be expected to write *GOOD* titles for all of your graphs.)

9. What is ‘wrong’ with the graph at A.5 on page 6?

10. When marking an axis, units are marked at ‘intervals’ that correspond to intervals between the experimental points. What do we call these little marks?

(NOTE: Be sure to examine the figure at A.7 carefully. The graphs you make in lab will be expected to appear in a similar fashion, including frames.)

11. What is the vertical scale (y-axis) called? _____

12. What is the horizontal (x-axis) called*?*_____

13. When time is shown on the abscissa and amount of quantity shown on the ordinate, we call this a 'progress' graph or 'progressive curve.' Why is it possible to represent TWO of these graphs/curves on Fig a.10 on page 9?

(Note that each of the lines are labeled – this is expected in our lab graphs!)

14. Which line on the graph at Fig A.10 shows a 'faster' process? How can you tell by looking at the graph?

15. What is the rate for Process I? _____

16. What is the rate for Process II? _____

(*Note: Be sure you understand HOW the answers to 15 and 16 above are obtained by reading the graph!)*

17. What is meant by the term "slope?"

18. What visual aspect of a graph suggests the slope? 

19. Study the two graphs at Fig. A11 on page 10. The graph on the left is called a

    _____ graph/curve while the graph/curve on the right is called a

    _____ graph. Which part of the graph is different? _____

20. On a rate graph, rate is shown on the y-axis and is known as the dependent variable. Time, on the x-axis, is known as the 'independent' variable.
    Why is the measure on the x-axis called INDEPENDENT?

21. What must a rate graph always show on one of its axes?

22. What other types of independent variable may be on the abscissa of a rate graph?

23. Refer back to question #22, what other types of independent variables may be placed on the abscissa when attempting to grow a plant, or to get seeds to germinate?

24. For emphasis here, state what a progress curve and a corresponding rate curve must show:

Progress Curve –

Rate Curve –

25. Examine the graph at Fig. A.12.
Why is the Process I line higher on the graph?

Why are the curves flat?

26. Examine the graphs at Fig A.13 on page 11. What is different about the line, or slope, on the progress curve when comparing this graph to the previous ones studied? Why?

27. How will this be reflected in the rate curve?

28. Study the figure at A.14, line C. Notice that the line is not straight. The average slope is 2.5 units/hr. (*Note: Be sure to understand this before moving on.)* Why is this information misleading?

29. How can we find the 'true slope' at TWO hours?

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30. Concept wrap-up…
So…a perfectly flat curve (Process I or II) means that the rate curve will be depicted as a _____ line. However, a progress curve with changes in slope (Process III) will give a rate curve that looks like_____

Flatness in a progress curve and flatness in a rate curve mean different things:

31. ***Carefully read the material on pages 13-15 regarding the progress and rate curves showing the growth of pea plants. Study what happens to the rate curve and how it correlates with the progress curve. Fill in the chart:***

What does the shape of the curve mean?	Progress curve/graph	Rate Curve/graph
Flat		
Curving upward	*(refer back to Fig A.8,9)*	
Curving downward	*(refer back to Fig A.8,9)*	
Reaction has stopped		

32. Other kinds of rate graphs are discussed on pages 15-18. Be certain to read over this, as you may need to refer to this for labs.