Name_____ Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Menstrual Cycle Graphing – Lab #12

Background: The seemingly simple action of conceiving a child in the human race is astounding at best given the number of events that must occur and the hormonal activity that must synchronize. Therefore, it is easy to understand why the human menstrual cycle is so crucial in the timing and efficiency of the female reproductive system. Without hormone cycles, feedback mechanisms, and near perfect timing, this system would not allow a human egg to be fertilized, developing into an embryo and ultimately being delivered as a human baby.
The cycles that are most important are those of four different hormones: follicle stimulating hormone (FSH), luteinizing hormone (LH), progesterone, and estrogen. These hormones, produced in the pituitary gland and in the ovary, are specifically timed and influence each other's production and repression during the 28-day cycle and make it possible for a female to become pregnant.

Purpose: The purpose of this laboratory experience is:

-to examine the events of the human menstrual cycle with regard to hormone levels, ovarian function, and uterine structure;
-to graph the changing levels of FSH, LH, estrogen, and progesterone during the 28-day cycle.
-to study how hormone feedback levels and mechanisms control a cyclical functioning mechanism.

Materials: The following materials are used to perform this experience:

-lab papers	-pens and pencils
-graph paper	-colored pencils (optional)

Procedure: The following procedure is utilized to perform this experience:

1. Look at the "Data" portion of this lab, which shows the events of the menstrual cycle. Construct "Graph A" using the data table and the data for the relative levels of FSH and LH released from the pituitary gland.
2. After completing Graph A, construct "Graph B" using the data from the data table for the relative levels of estrogen and progesterone released from the ovary.
3. Make sure to notice that each graph has two different y-axes, one for each of the hormones listed.
4. **Teacher Hint**: When graphing from the left side y-axis, start with data from Day 1, then Day 2, Day 3…. When graphing from the right side y-axis, start with data from Day 28, then Day 27, Day 26…
5. Compare the data that you graph to the diagram which shows changes in ovarian function and uterine structure and answer the questions.

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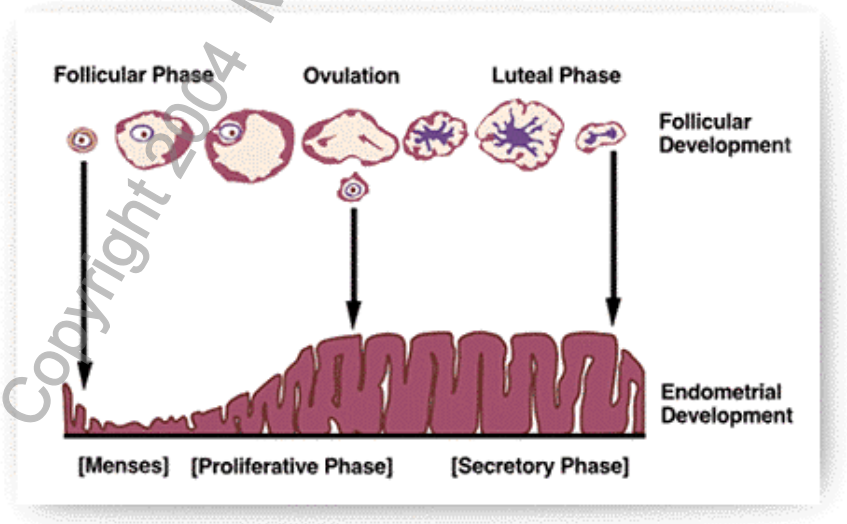
Name_____ Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Data: The following data was collected and analyzed during this lab experience:

	Concentrations of Hormones				
	Day	FSH	Estrogen	LH	Progesterone
Concentration of Hormones in Blood: Follicular Phase	1	9	30	9	0.6
	2	11	40	12	0.8
	3	13	50	16	1.0
	4	14	70	18	1.0
	5	15	80	19	1.0
	6	14	100	16	1.0
	7	14	130	12	1.2
	8	15	140	19	1.2
	9	13	180	15	1.3
	10	11	200	16	1.5
	11	9	220	20	1.5
	12	18	230	30	1.6
	13	13	220	75	1.8
	14	9	200	58	2.0
Concentration of Hormones in Blood: Luteal Phase	15	9	180	30	2.3
	16	8	150	14	3.7
	17	8	120	10	5.8
	18	8	100	9	8.3
	19	8	50	7	10.4
	20	7	30	5	12.0
	21	7	25	3	12.0
	22	6	25	3	11.8
	23	5	25	2	10.3
	24	5	25	3	7.2
	25	6	20	3	4.0
	26	7	20	4	3.0
	27	7	25	5	1.5
	28	8	25	7	0.8



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Name_____ Date of Data Collection_____

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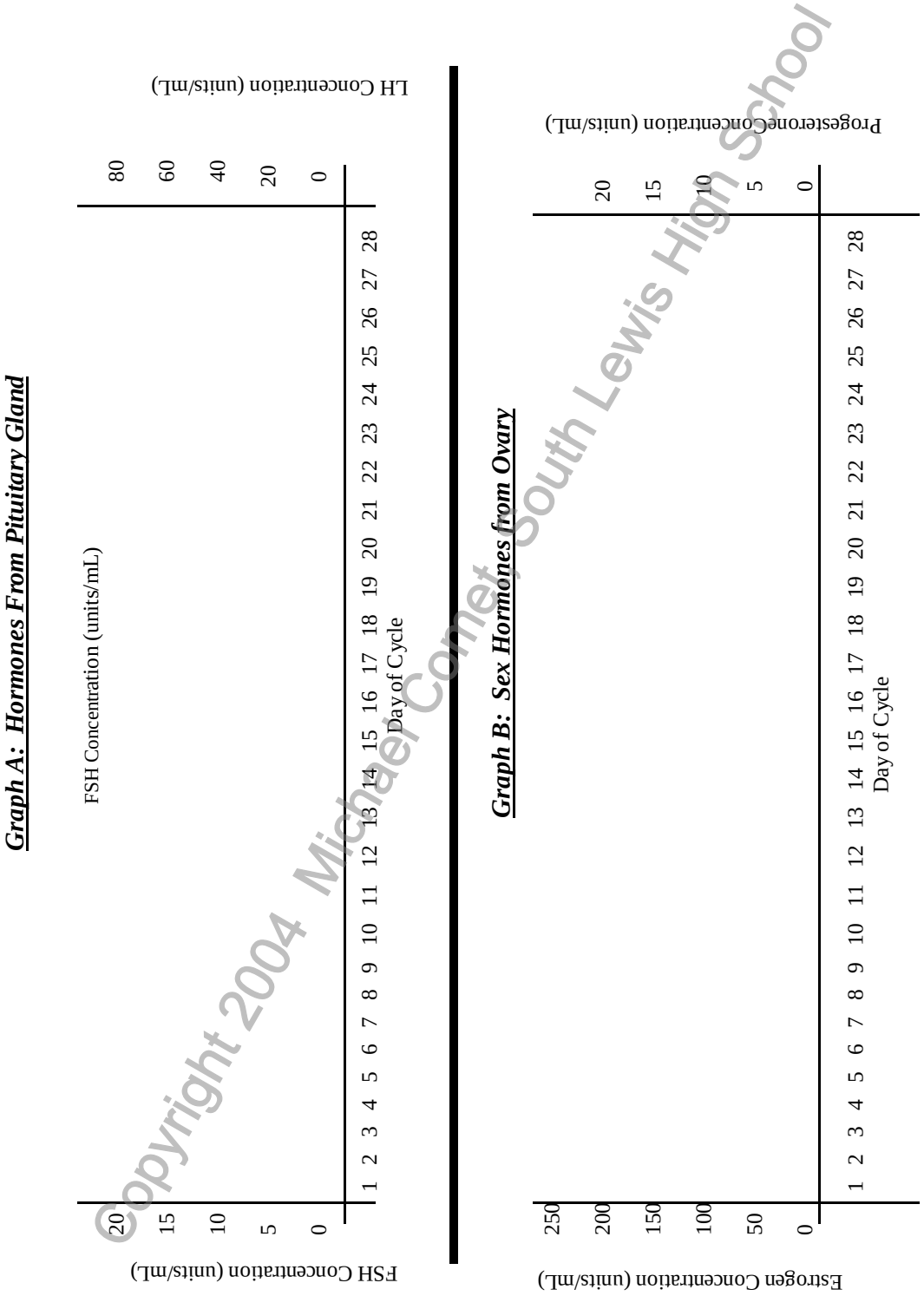

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Name_____ Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Conclusion: Write a well-balanced conclusion for this experience.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Analysis Questions: Answer the following questions in the spaces provided.

1. On what day does FSH reach its' maximum concentration? What is happening with regard to the ovary at this point and what is happening with regard to the menstrual cycle?

   _____

   _____

   _____

2. What happens to the follicle during the first 14 days that you plotted?

   _____

   _____

   _____

3. What happens in the ovary and in the blood stream in days 1-14 that bring about a change in the uterus?

   _____

   _____

   _____

4. On what day does LH reach its' maximum concentration? What is happening with regard to the ovary at this point and what is happening with regard to the menstrual cycle?

   _____

   _____

   _____

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5. Why does the level of FSH decrease and remain at a relatively low level during days 15-28 of the cycle?

   _____
   _____
   _____

6. What signals the end of one cycle and the beginning of another?

   _____
   _____
   _____

7. Why are the interactions of hormones and tissues in the menstrual cycle considered to be feedback mechanisms?

   _____
   _____
   _____

8. What roles does progesterone play in the feedback mechanism?

   _____
   _____
   _____

9. What roles does estrogen play in the feedback mechanism?

   _____
   _____
   _____

Bibliography of Images Used

-Endometrial Development: http://www.sw.org/sw/iwcontent/public/obgyn/en_us/images/obgyn_cycle.gif
-General idea for the lab was modified from Prentice Hall, Biology, Worksheet bundle, Copyright 1999.

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