The Menstrual Cycle

Name _____
Date _____Period_____

PRE-LAB

1. Write down three facts you know about the menstrual cycle.

   A.
   B.
   C.

FOLLICULAR PHASE

Within the ovaries are located many egg cells. Each egg is enclosed within a structure called a **follicle**. The follicle is said to be immature. Under the influence of a hormone called **FSH (follicle stimulating hormone)**, the follicle matures.

2. Prepare a **line graph** of the data in Table 1. *Remember to place numbers along each axis.*

Table 1. FSH

DAY	UNITS OF FSH
1	10
3	12
5	14
7	13
9	13
11	14
13	20
15	10
17	9
19	9
21	8
23	8
25	8
27	10

Graph 1. AMOUNT OF FSH PRESENT

Units of FSH Present

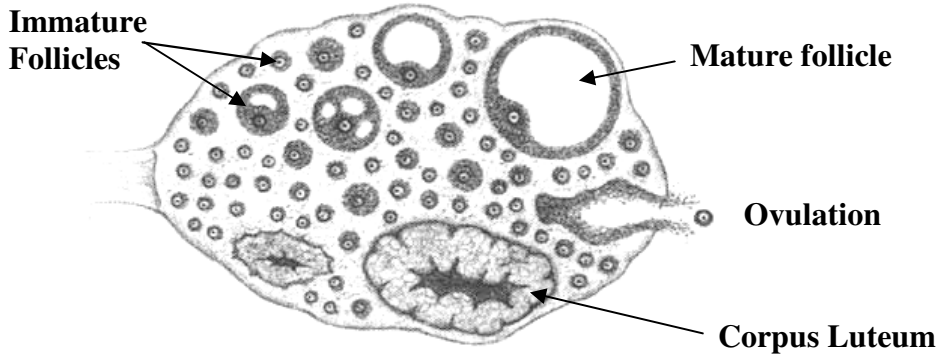
Day

3. FSH is a hormone in the female body that causes a woman's **follicles** (the structures that contain **eggs**) to mature, within the **ovary**. On which day of the cycle has the follicle reached maturity? Day_____

Adapted from "Investigating Living Systems Laboratory Manual", Glencoe/McGraw-Hill

LUTEAL PHASE

Once a follicle is mature, it bursts open and the egg is released. This process is called **ovulation**. The egg passes into the oviduct where it may or may not become fertilized. Meanwhile, the mature follicle, once it loses its egg, forms a body within the ovary called the **corpus luteum**.



A hormone called **luteinizing hormone (LH)** is responsible for ovulation.
Table 2 shows data obtained from blood samples taken from a female and analyzed for the amount of LH present.

4. Prepare a **line graph** of the data from Table 2. *Remember to place numbers along each axis.*

Table 2. LH

DAY	UNITS OF LH
1	12
3	14
5	14
7	14
9	14
11	16
13	70
15	12
17	12
19	12
21	12
23	12
25	8
27	8

Graph 2. AMOUNT OF LH PRESENT

Units of LH Present

Day

5. Luteinizing hormone stimulates the follicle in the ovary to release an egg. On which day of the cycle will an egg be released? Day_____

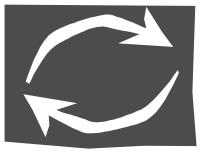
CHANGES IN THE UTERUS

While the follicular and luteal stages are taking place in the ovaries, a series of changes is also occurring in the uterus. The uterus lining changes from being very thin to being very thick. This change in thickness occurs because the number of cells increases through rapid cell division. At one point, the uterus ceases to thicken. The buildup of cells begins to break apart. This breakdown of the uterine lining, both as tissue loss and bleeding, is called **menstruation**.

Two hormones are responsible for the thickening of the uterus, **estrogen** and **progesterone**. The amount of these hormones in the bloodstream influences the changes just described.

Table 3. AMOUNT OF ESTROGEN AND PROGESTERONE PRESENT

Day of cycle	Units of **Estrogen** present in blood		Day of cycle	Units of **Progesterone** present in blood
1	50		1	5
3	50		3	5
5	50		5	5
7	75		7	5
9	125		9	5
11	225		11	5
13	200		13	10
15	75		15	40
17	100		17	60
19	100		19	110
21	100		21	150
23	100		23	150
25	50		25	100
27	50		27	30



6. If you were to construct a line graph from this data, how many lines would there be?_____

7. What descriptions would you place on the X-axis and the Y-axis? What would the numerical ranges be on the X-axis and the Y-axis?

X-axis description:_____ Range (x-axis)= 0-_____

Y-axis description:_____ Range (y-axis)= 0-_____

8. **Construct a graph from the data in Table 3 on the page provided at the end of this lab.** Label the axes (x and y) with the descriptions from question #7 above. *Remember to place numbers along each axis.* Add a title and plot the values from the chart. Please use different colors for each line drawn and label each line.

9. Based on Graph 3, when do estrogen and progesterone reach their peaks?

Estrogen peak: Day_____ **Progesterone** peak: Day_____

POST-LAB

10. After a follicle has released an egg it turns into a **corpus luteum ("yellow body")**. This in turn releases estrogen and progesterone, which cause the uterine lining to thicken and prepare to receive a fertilized egg. On which day would the uterine lining be the thickest? Day_____

11. Look at the LH graph (Graph 2). How much time passes from the time the egg is released (Question #5) until when the uterine lining is the thickest (Question # 10)? _____ Days

What might account for this? HINT- Where does egg start and where is the uterus?

12. If an egg is **not fertilized**, estrogen and progesterone levels drop. When this occurs, the thick lining of the uterus falls off and is released. This causes menstrual flow, or the menstrual period. During which days in the cycle does menstruation occur? Days _____

13. If an egg **is fertilized**, it will attach to the thick uterine wall and estrogen and progesterone will continue to be released. What two things do these hormones **prevent** from happening?

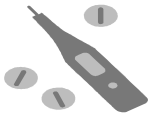
a. _____
b. _____

14. There are four stages/phases in a given menstrual cycle. Match these stages/phases with the days below. Draw a line connecting the stages/phases and their corresponding days.

Follicular Phase (follicle is developing)	**~Day 14**
Ovulation (egg is released)	**~Days 1-5**
Luteal Phase (corpus luteum releases estrogen and progesterone)	**~Days 15-28**
Menstrual Period (excess uterine lining and unfertilized egg released)	**~Days 6-13**

15. How might one “trick” the female body into thinking it was pregnant?

16. After an egg implants on the thick uterine lining, the egg releases a hormone called hCG, or human chorionic gonadotrophin (Home pregnancy kits test for this hormone). What might be the purpose of this hormone?



17. Under which situations/conditions would the menstrual cycle stop?

18. Why would the menstrual cycle stop during pregnancy?

19. Is it possible to become pregnant during menstruation? Why or why not?

20. If you miss your period, does that mean that you are pregnant? Explain.

Graph 3.