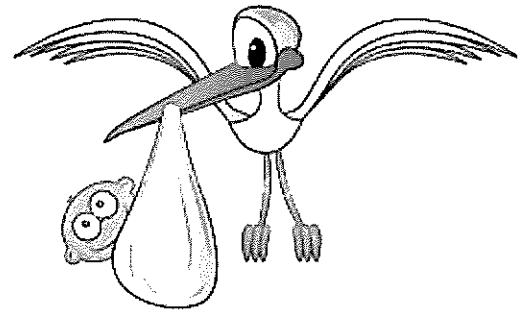


Pregnancy, Childbirth and Infant Development Handout

Nelson Chapter 19





Pregnancy and Childbirth - The Real Story

During the Program

First trimester: embryo development

1. Why is the first trimester the most important, according to Dr Steinberg?

2. How is the estimated delivery date calculated?

3. At what stage of the first trimester (i.e. number of days/weeks) are each of the following terms used to describe the developing baby?

a) blastocyst

b) embryo

c) zygote

4. Why is a diet rich in folate necessary?

5. At what stage in the first trimester does the placenta develop?

First trimester: maternal health

6. Around 10 weeks, a pregnant woman has several tests performed. Name three things she might be tested for at this stage.



7. When is the first ultrasound performed, and what are they looking for?

8. What are some of the physical changes women experience during pregnancy?

9. Why do you think it's important to identify which pregnancies are high risk as early as possible (i.e. during the first trimester)?

Second trimester

10. Name one of the key milestones that take place during the second trimester.

11. What does the placenta do?

12.a) At approximately what stage is an ultrasound done in the second trimester?

b) Name one of the things they are checking at this stage.

13. Midwives routinely check the fundal height. Explain:

- what is being measured
- how it is measured
- what this measurement indicates.



14. Define:

a) lanugo

b) vernix

Third trimester

15. Why would you advise a parent to attend antenatal classes?

16. What can a lack of protein and calories late in pregnancy lead to?

17. At what stage of the pregnancy does the baby move into position ready for the birth?

The birth

18. What are the different types of birth deliveries?

19. If caesarean section is performed what are some possible complications?

20. For a woman having a hospital birth, what are some of the indicators it's time to go into the hospital?

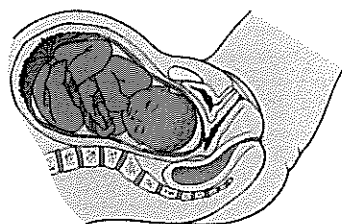
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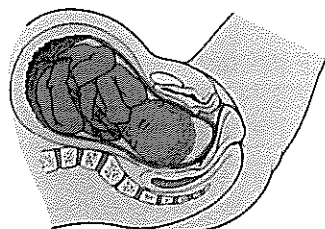
WORKSHEET

19.1 Stages of labour

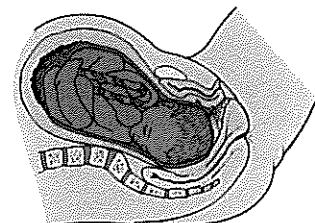
State which stage of labour is shown in each illustration, and describe the events pictured.



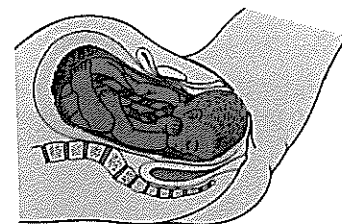
Stage of labour:
Main events:



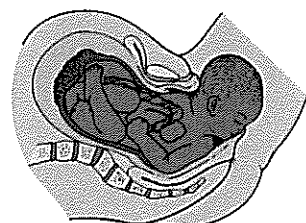
Stage of labour:
Main events:



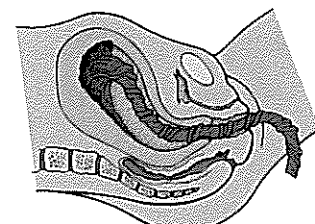
Stage of labour:
Main events:



Stage of labour:
Main events:



Stage of labour:
Main events:



Stage of labour:
Main events:

Activity 51: Maternal and Foetal Observations

Background information:

During pregnancy changes take place in the mother to accommodate the growing foetus, prepare for its birth and provide for its nutrition after birth. The development of the foetus is indicated by the observations made by the mother and medical technologies, such as ultrasound.

Purposes:

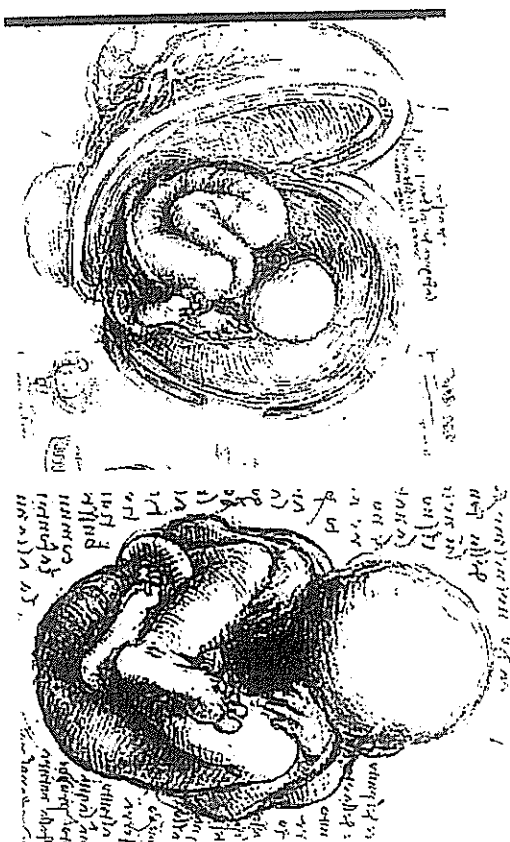
- to explain how maternal changes during pregnancy provide for the growing foetus and prepare for its birth and post-natal care.
- to explain how genetic and environmental factors influence maternal changes during pregnancy and birth weight.

Materials:

graph paper

Procedure:

- a. Use the data provided on the following pages to graph the changes for each mother.
- b. Discuss the way in which your will display the data to allow for easy comparisons between mothers.
- c. If you know of a member of staff, relative or friend, who has recently become pregnant, you may wish to ask them to keep a similar record for you, in which case you may use the blank data sheet. It may be possible for the class to follow a particular mother's pregnancy, birth of the baby and its early stages of development. For example, the mother could visit the class at regular intervals for measurements and observations.



Drawings by Leonardo da Vinci in about 1512.

Mother 1: Heather Smith.

Expected date of birth: August 19, 1992.

Actual date of birth: August 26, 1992 (4.40 pm.)

Time since start of records (weeks)	Bust (cm)	Waist (cm)	Hips (cm)	Mass (kg)	Observations. (U = ultrasound)	Baby
0	86.4	66.0	88.8	50.5	Tired. Facial pimples.	
4	87.2	67.2	88.8	50.6	Ill in evenings - can't eat or prepare food. Smell of alcohol very distasteful.	
7					'Show' - bed for the weekend. Tired still.	
8	88.8	70.0	88.8	52.0	Facial pimples gone, some on chest and back.	First Ultrasound - very exciting to see. Baby's head 3 cm diameter. Faint heart flutters seen
9					Very tired.	
10						Kicks felt.
12	90.6	75.2	89.8	54.0		
13						Head = 4.9 cm (U) Heartbeat very fast.
16	92.6	79.2	92.0	56.4	Skin completely cleared.	Kicking.
17					Still tired at night.	Strong kicks, mainly at night.
20	94.2	82.8	94.0	58.4	Breathless with exertion.	
24	95.2	86.4	94.8	59		
25					General loss of appetite.	
26					Last day at work.	Tumbling around.
27					Need to urinate frequently. About every hour!	
28	95.4	90.8	95.4	62.0	Backache late afternoon. Contractions at times.	Head engaged. Very strong movements.
29					Very heavy feeling. Feel tired and weepy. Now visit doctor weekly.	Very strong movements still.
32	94.8	95.2	95.8	63.0	Uncomfortable and heavy. Still ready!	Strong, painful movements.

Caroline Smith was born at 16.40 hours on day 6 of week 34 since records started. Mass = 3280 g.

Mother 2: Jillian Sotherby

Expected date of birth: December 2, 1989.

Actual date of birth: November 29, 1989, (8 pm.)

Time since start of records (weeks)	Bust (mm)	Waist (mm)	Hips (mm)	Mass (kg)	Observations. (U = ultrasound)	
					Self	Baby
0	914	711	965	63.0	Nausea but no vomiting	
4	924	748	986	65.0		
8	938	784	1005	67.0		
12	956	838	1041	69.0	Pimples.	Heart rate = 150 beats per minute.
15					Pimples and first moisture from breasts.	
16	980	856	1046	70.3		Heart rate = 130 beats per minute.
20	1004	896	1064	72.1		
24	1030	930	1084	73.4	Fluid	
28	1040	945	1092	74.5		Heart rate = 110 beats per minute.
30					Breathless	Kicking very vigorously
32	1041	976	1092	75.4	Protein in urine. All other symptoms normal. Uncomfortable - bending almost impossible.	Movements more painful. Feels like its knocking against pelvis.
33					Over past weeks increased nasal congestion and increased vaginal discharge.	
35						Heart rate = 140 beats per minute.
36	1041	1016	1092	75.5	Urine normal. Cut toe. Went into shock and fainted. Damage to me, grazed and bruised. Damage to baby, none I hope!	Heart rate = 140 beats per minute. Baby's head down but body rotates from side to side. Heart heard on different sides each week by doctor.
38	1041	1016	1092	76.0	Cramp like period pains. Cervix softened.	

Tony Sotherby was born at 20.00 hours on day 1 of week 39 since start of records. Mass = 3656 g.

Mother 3: Georgina Robinson

Expected date of birth: November 10, 1984.

Actual date of birth: November 9, 1984.

Time since start of records (weeks)	Bust (mm)	Waist (mm)	Hips (mm)	Mass (kg)	Observations. (U = ultrasound)	
					Self	Baby
0	870	700	930	56.5	Well.	Head 335 to 360 mm (U) Saw Heartbeat and vigorous movements.
2					Waist disappearing.	Tummy enlarging. Baby growing.
4	870	740	930	57.0	Well.	Definite kicks. Lying across my tummy. Head to boltk = 152 mm. Full length = 255 mm. (U)
8	860	760	940	59.0	Tired but happy to feel responses.	Can see kicks push out r tummy.
12	880	790	930	60.5	Tired. Amazed to watch baby move.	Baby lying across tummy Can see baby's turning movements on my tummy
16	912	806	953	62.4		
17					Can express colostrum.	I heard rumbling noises through the stethoscope.
20	910	900	970	64.0	Well.	Doctor heard heartbeat.
22					Well. Tummy very tight.	Hiccupping.
24	903	918	983	65.0	Sharp pains at cervix.	Hiccupping. Kicking everywhere.
25	903	930	990	65		

Julie Robinson was born on day 2 of week 26 since start of records. Mass = 3170 g.

9. Explain the reasons for any weight gain differences not due to the baby as shown in the previous question.

10. Examine the changes in maternal bust, waist and hip measurements and in weight shown on the graphs and suggest explanations for the changes.

11. Why are the internal changes reflected in these changes in maternal measurements necessary?

12. Compare the graphs for waist and hip measurements. Which part of the abdomen accommodates most of the increase in bulk?

13. Consider all three sets of data. What changes did the mothers observe in themselves during the last two months? Where possible explain these changes.

14. Were the babies' birth weights 'normal'? Explain.

15. Consider the three sets of data. Do they show similar patterns of change? Suggest reasons for any differences.

Activity 52: Foetal Growth and Development

Background information:

During gestation, the period between conception and birth, a foetus grows in size. This growth is accompanied by changes in form and function or development.

Purposes:

- to describe the structural and physiological changes happening during embryonic and foetal development.
- to name the techniques presently available for studying the foetus in utero.

Materials:

graph paper

Procedure:

- Graph the data for embryo and foetal length and mass that appear in the table below.
- Indicate the trimesters on your graph.

Table 1: Timetable of Foetal Growth and Development

Time (weeks)	Length (mm)	Mass (g)	Developmental Stages
0	0	0	Fertilisation.
1	0	0	Embryo reaches uterus. Implantation.
2	0		A flat, 2-layered disc i.e. only ectoderm and endoderm. Sac-like digestive tract with no mouth or anus. Umbilical cord forming.
3	2.5		3 layers present: ectoderm, mesoderm and endoderm. Beginnings of skeletal and nervous systems.
4	6		Simple 2-chambered heart, beating 60 beats/min. Tail, gill pouches, limb buds. Muscular system forming. Neural tube closing to form spinal cord and brain.
5	12		Mouth, eyes, webbed fingers and toes, lungs and regions of digestive canal form.
6	16	1	Cerebral hemispheres, face, ears form.
7	19	2	Eyes open. Tail disappears.
8	26		All major systems formed. Now called a foetus. Ossification (replacing cartilage by bone) begins. Makes small movements, but not yet felt by mother.
9	38		
12	90	30	External genital organs developed.
16	150	180	'Quickening' (movement) felt by mother. Heart can be heard.
21	300	450	Heart rate 140 beats/min. Head hair appears. Skin glands produce vernix caseosa a white creamy paste to protect delicate new skin. Sleeps and wakes.
25	350	875	Vigorous movements.
30	400	1425	Testes descend. Fat deposited. Fine hair (lanugo) covers head and body.
34	450	2375	Lanugo drops away. Takes up birth position, head down usually.
38	500	3250	Full term. Skin covered with cheese-like vernix caseosa. Foetus has moved down in pelvis. Foetus' pituitary signals for birth to begin.

Note that these data have been obtained by combining several sources. Figures are rounded for simplicity.

1. In which of the following intervals does the baby form the major body systems?
months 0-3 ☐ months 4-6 ☐ months 7-9 ☐
2. During which of the following time intervals is increase in length most rapid?
months 0-3 ☐ months 4-6 ☐ months 7-9 ☐
3. How do you know this from the graph?

4. During which of the following intervals is increase in mass most rapid?
months 0-3 ☐ months 4-6 ☐ months 7-9 ☐
5. How do you know this from the graph?

6. What developmental changes could cause this increase in mass?

7. What process increases cell numbers as the baby grows?

8. The data supplied come from several sources, some pre-dating modern techniques for examining the foetus *in utero*. How do you think these older data were obtained?

9. In the light of your answer do you think the older data are reliable for studying human foetal development? Explain.

10. What new techniques are available for studying the foetus *in utero*?

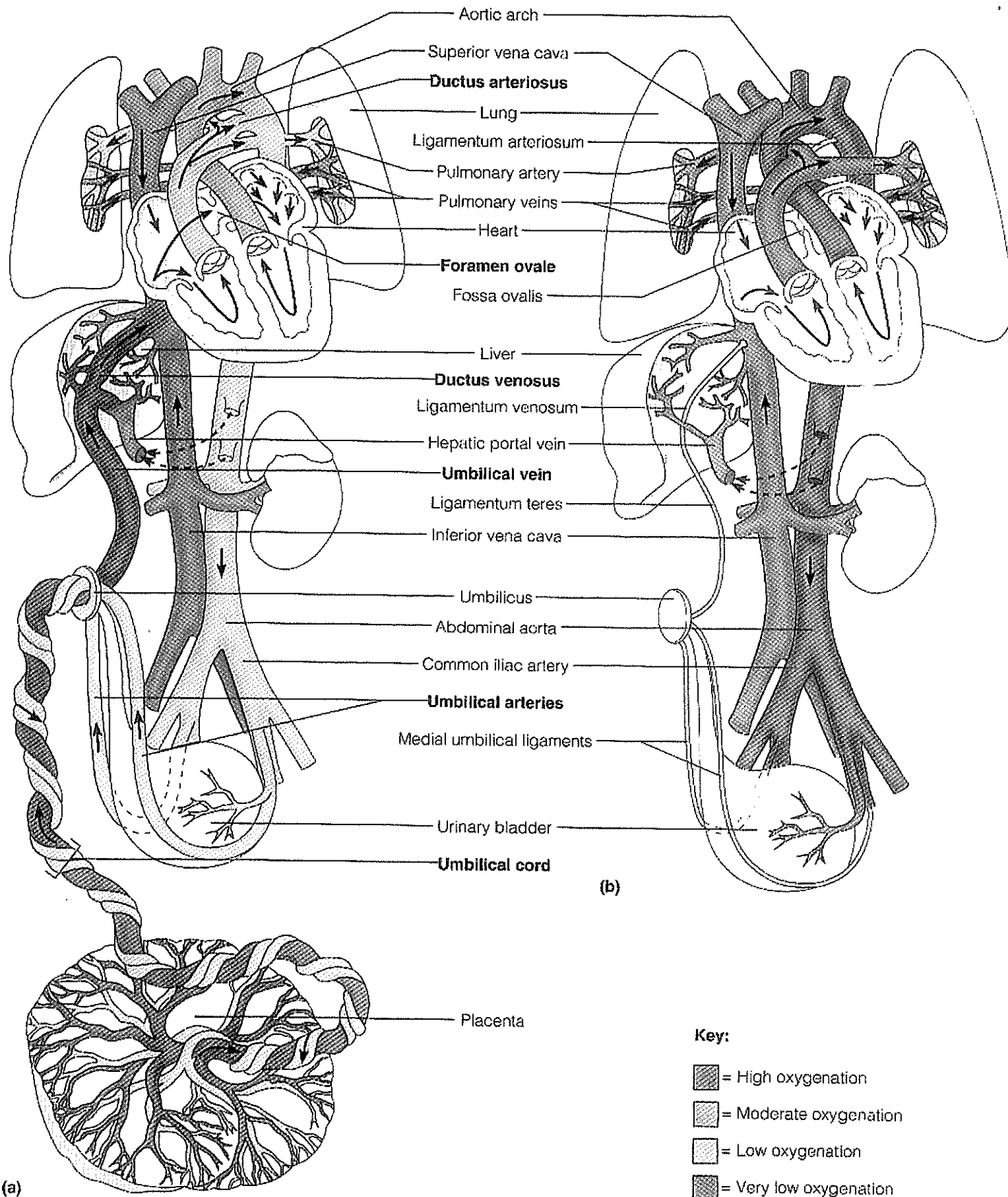
11. Are there any problems involved in combining data from several sources? Explain.

12. Babies born at 25 weeks have a very small chance of survival. State the main problems that affect the survival of very premature babies.

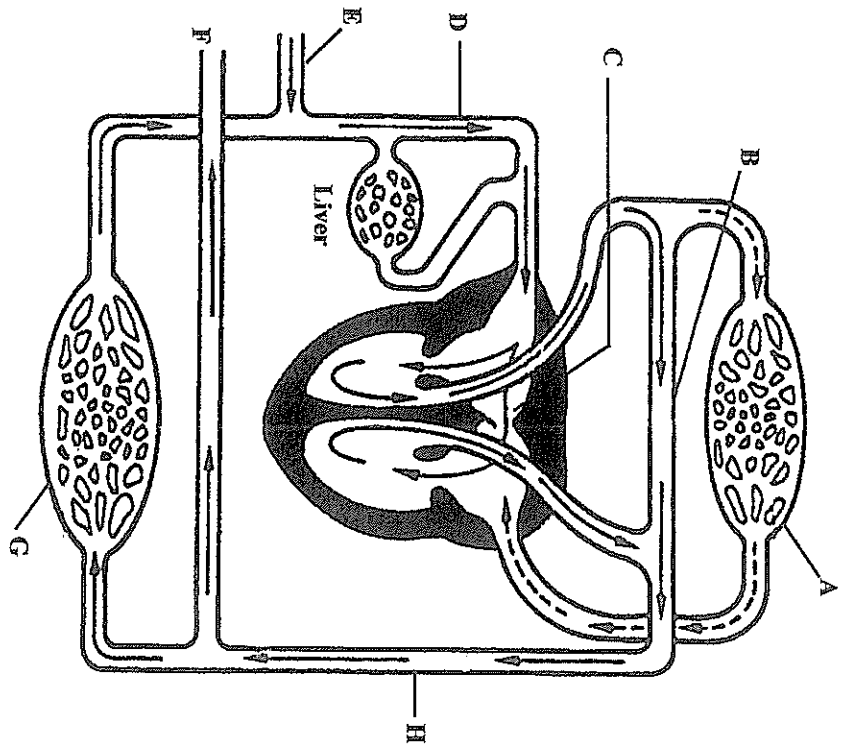
Module 2B.3: Development

Objective: Construct a chart to contrast the environment of the foetus during pregnancy with that of the newborn child.

Factor	Foetus	Newborn
Temperature		
Food supply		
Gas exchange		
Protection		
Support		
Waste removal		



Foetal circulation



1. Label the structures A – H
2. Explain the function of structure:

B. _____

C. _____

D. _____

E. _____

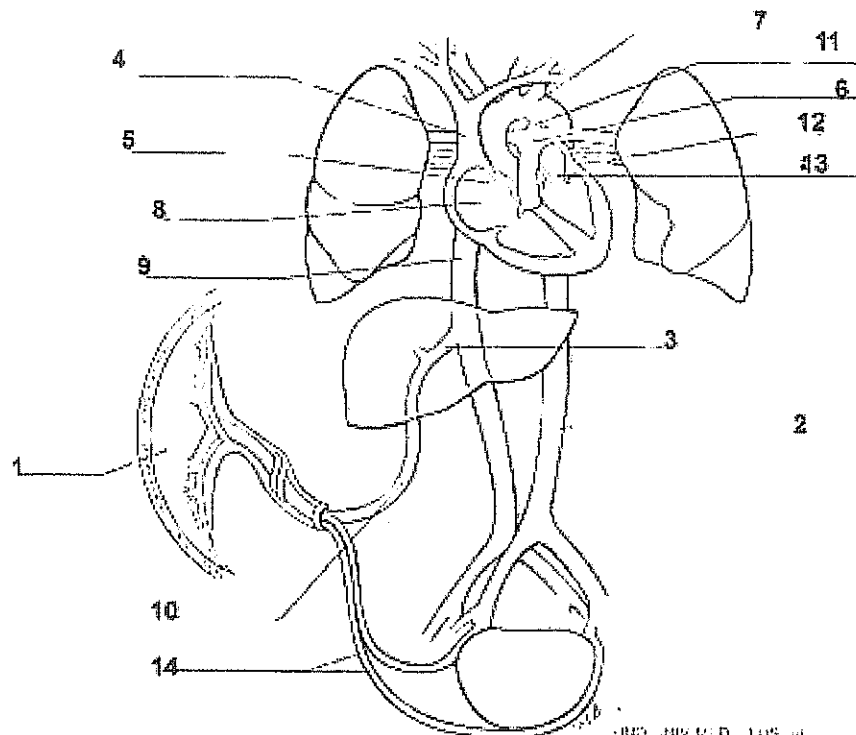
F. _____

G. _____

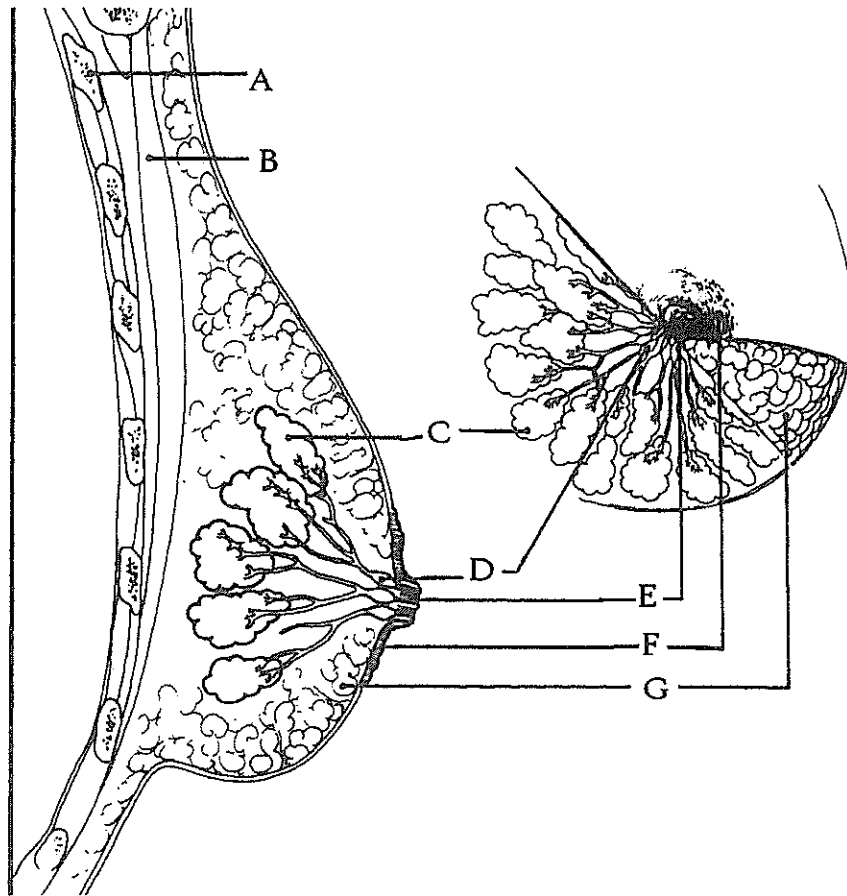
3. On the back of this sheet draw the circulation of a newborn (neonate) to compare before and after birth.

Fetal Circulation

Umbilical vein
Placenta
Right atrium
Umbilical arteries
Ductus arteriosus
Superior vena cava
Foramen ovale
Inferior vena cava
Left atrium
Descending aorta
Pulmonary trunk
Pulmonary veins
Aorta
Ductus venosus



BREAST STRUCTURE AND LACTATION



1. Label the breast structures on the diagram above. For each give its function.
2. Define Lactation
3. Which two hormones are involved in breast development and feeding? How exactly are they involved?

