

Student Laboratory Packet

How Does a Human Fetus Change During Development?

A Laboratory Activity for the Living Environment

Development (which is a change in form or appearance as an animal grows) in humans takes about 38 weeks. Many changes take place with the fetus during this time, starting with an embryo, which is an undeveloped living thing (first eight weeks) until it becomes a fetus (embryo that has all of its body systems). Changes that do occur during this time are increases in mass (the amount of matter in an object) and size. Premature birth sometimes will occur when the fetus is born before 38 weeks of development.

GOALS

In this activity, you will:

- measure the length of diagrams of the human fetus.
- graph the length and mass of a human fetus.
- determine when during development most changes in mass and size occur.

KEYWORDS

Define the following keywords:

development _____

embryo _____

fetus _____

mass _____

premature _____

MATERIALS

metric ruler

PROCEDURE

Part A. Development of a Human Fetus

- Look at Figure 1. It shows six stages of a developing human fetus. They are shown at 40% of their natural size.
- Follow the steps outlined below to measure the total length of each stage. Use the metric ruler and measure in millimeters. Use the 38-week stage as a guide and record your data in the spaces provided in Table 1.
 - Measure the body length from the rump to the top of the head.
 - Measure the thigh length from the rump to the knee.
 - Measure the length of the leg from the knee to the foot.
- Add all three measurements together and record the total in the space provided in Table 1.
- Multiply the total by 2.5 to give a figure that is close to the actual size of the fetus at each stage.
- Record this actual size in the table.

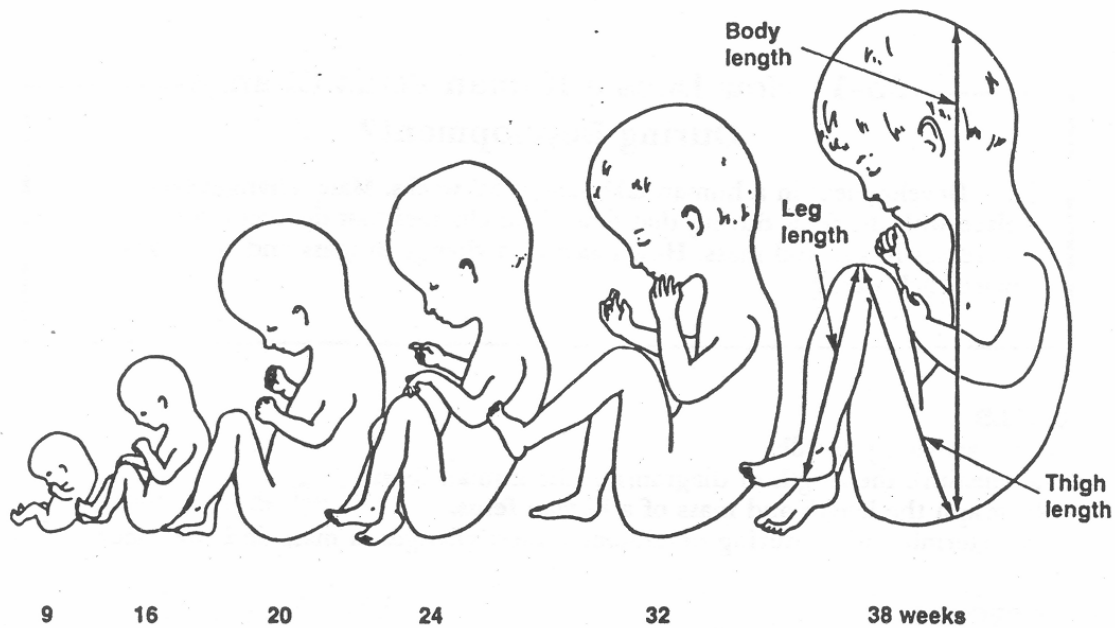


FIGURE 1. Stages in the development of a human fetus

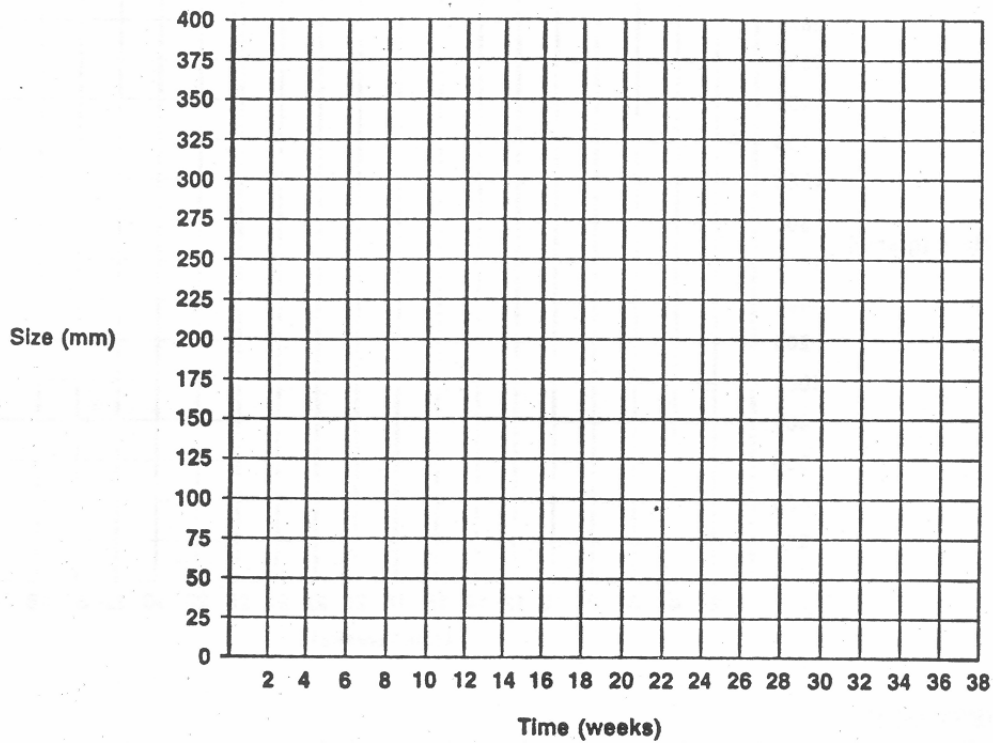
Table 1. Lengths of a Developing Fetus

Age of fetus in weeks	Body length	+	Thigh length	+	Leg length	=	Total length	$\times 2.5 =$	Actual length
2									
9									
16									
20									
24									
32									
38									

Part B. Plotting Length of a Developing Fetus

1. Plot the data from Table 1 onto the graph in Figure 2.
2. Plot the actual fetal length against the age of the fetus. Notice that the length of the fetus at week 2 has already been plotted.

FIGURE 2. Length of a developing fetus



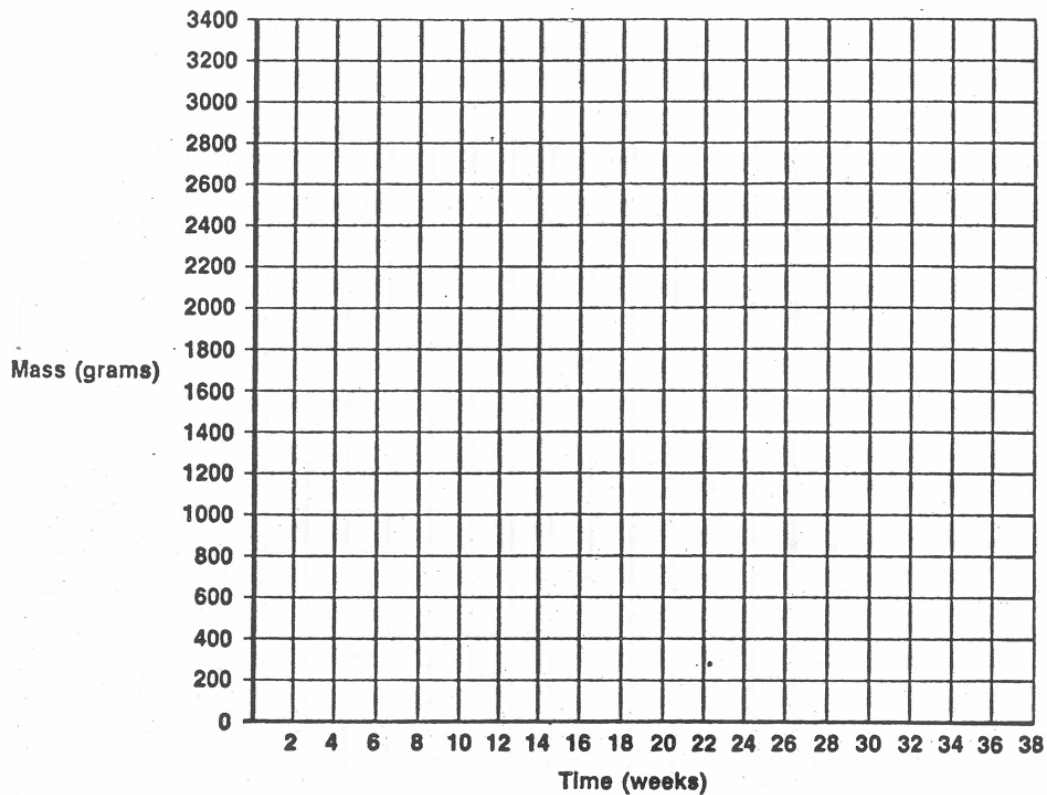
Part C. Plotting Mass of a Developing Fetus

1. Look at the data supplied in Table 2.
2. Plot the data of the developing fetus from Table 2 onto the graph in Figure 3.
3. Plot the mass of the fetus against the age of the fetus.

Table 2. Mass of a Developing Fetus

Time (weeks)	Mass (grams)	Time (weeks)	Mass (grams)
4	0.5	24	650
8	1	28	1100
12	15	32	1700
16	100	36	2400
20	300	38	3300

FIGURE 3. Mass of a developing fetus



QUESTIONS

1. During what weeks of development is the human baby called an embryo?

2. What is the length of an embryo during this time? _____
3. How much mass does an embryo gain during this time? _____
4. During what weeks of development is the human baby called a fetus? _____
5. Look at Figures 2 and 3 for the halfway point in development at week 19.
 - a. Is the fetus half of its full length at this time? _____
 - b. Is the fetus half of its full mass at this time? _____
6. a. At what week does the fetus reach half its full length? _____
 b. At what week does the fetus reach half its full mass? _____
7. If a premature baby is born with a mass of
 - a. 2200 grams, how old is the fetus? _____
 - b. 1800 grams, how old is the fetus? _____

