How Does a Human Fetus Change During Development?

Development in a human takes about 38 weeks. Many changes take place with the fetus during that time. Two changes that do occur are increases in size and mass. How much of a change in mass and size takes place each week?

OBJECTIVES
In this activity, you will:
1. measure the length of diagrams of the human fetus.
2. graph the length and mass of a human fetus.
3. 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
1. Look at Figure 1. It shows six stages of a developing human fetus. They are shown at 40% of their natural size.
2. 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.
   a. Measure the body length from the rump to the top of the head.
   b. Measure the thigh length from the rump to the knee.
   c. Measure the length of the leg from the knee to the foot.
3. Add all three measurements together and record the total in the space provided in Table 1.
4. Multiply the total by 2.5 to give a figure that is close to the actual size of the fetus at each stage.
5. Record this actual size in the table.
FIGURE 1. Stages in the development of a human fetus

Table 1. Lengths of a Developing Fetus

<table>
<thead>
<tr>
<th>Age of fetus in weeks</th>
<th>Body length + Thigh length + Leg length = Total length x 2.5 = Actual length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

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.
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

<table>
<thead>
<tr>
<th>Time (weeks)</th>
<th>Mass (grams)</th>
<th>Time (weeks)</th>
<th>Mass (grams)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.5</td>
<td>24</td>
<td>650</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>28</td>
<td>1100</td>
</tr>
<tr>
<td>12</td>
<td>15</td>
<td>32</td>
<td>1700</td>
</tr>
<tr>
<td>16</td>
<td>100</td>
<td>36</td>
<td>2400</td>
</tr>
<tr>
<td>20</td>
<td>300</td>
<td>38</td>
<td>3300</td>
</tr>
</tbody>
</table>
**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?