

MiSP Human Growth and Development Worksheet #1 L2

Name _____

Date _____

HUMAN GROWTH FROM AGES 2 TO 20 YEARS

Introduction:

People grow. They start before they are born, and growth continues until approximately age 20. We know that there is no normal height although most people fall in an average range. Genetics, nutrition, and general health affect how tall a person will be.

Do people, in general, grow at the same rate or are there growth spurts? You will look at data collected by the Centers for Disease Control and Prevention. They collected height measurements from many, many people and determined the average heights, by age, of children in the United States children from 2 to 20 years. You will be given a chart of the data with heights for boys and girls.

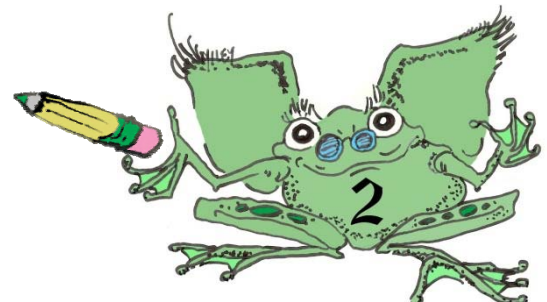
Procedures:

Review the data on the chart, “Median Heights of U.S. Boys and Girls.” It lists the age, in years, from 2 to 20, and the median height at each of those ages for boys and girls. Median is also called the “50th percentile.” That means that half of the children have a height less than the 50th percentile and half of the children have a height greater than the 50th percentile. Heights are given in centimeters (cm).

Graph the data:

Graph the boys’ or girls’ data on the next page to show the relationship between age (years) and height (cm). Plot both sets of data on the same graph. Use a different color pencil for boys and girls.

- Label the x -axis with age (years).
- Label the y -axis with height (cm).
- Connect the data points.
- Add a legend to your graph.
- Give the graph a title: “Median Height of U.S. Boys and Girls.”



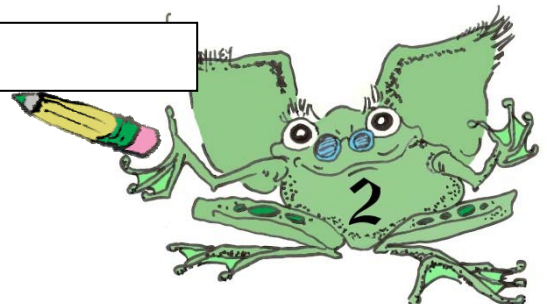
Empty rectangular box at the top of the page.

Vertical empty rectangular box on the left side of the page.

Large grid area for writing or drawing.

Discussion Questions:

Horizontal empty rectangular box for writing discussion questions.



1. It should be clear from your graph that as a child grows from age 2 to 20 years old, her or his height increases. You should also see that the increase does not occur at a constant rate (the height does not increase the same amount for each span of years). During which years is the growth rate the smallest?

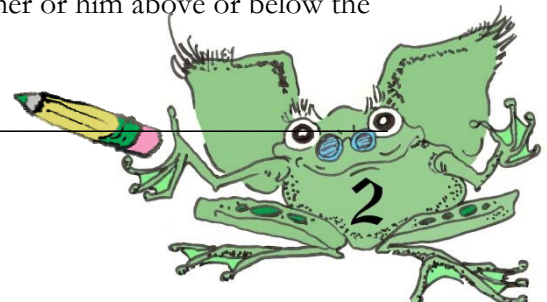
2. During which years is the growth rate the greatest?

3. People often talk about young people having growth spurts (when they increase in stature quickly). That often occurs during some time period between the ages of 10 and 14. Does your answer to 2 agree with there being a growth spurt between the ages of 10 and 14? Explain.

4. Compare the lines for girls and boys. List two ways the graphs are similar.

5. List two ways the graphs are different.

6. A 4-year-old child has a stature of 105.0 cm. Does that place her or him above or below the line for the median height (50th percentile) for age 4?



7. Does your answer to 6 mean that this child will always be above or below the median height (50th percentile) as he or she becomes 5 years old, 6, 7, etc.? Explain.

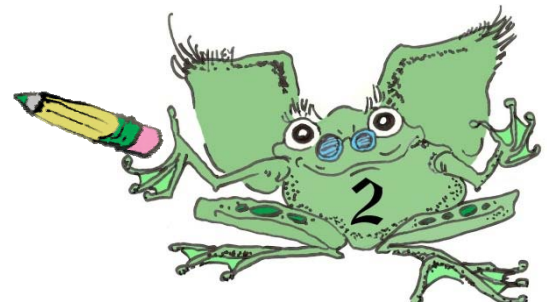
8. Use your graph to predict the median height of a 3.5-year-old boy and girl.

Boy _____

Girl _____

9. Compare the changes in height in two regions of the graph (2 to 10 years old and 18 to 20 years old) by calculating the unit rate of change (slope). **Use either the boys' or the girls' data.** Your teacher will tell you which to use.

$$\text{Unit Rate of Change} = \frac{\Delta y}{\Delta x} = \frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{\Delta \text{Stature (cm)}}{\Delta \text{Age (years)}}$$



Section of Graph	Ordered pairs (x_1, y_1) (x_2, y_2)	Δ Stature (cm) Δy	Δ Age (years) Δx	Unit Rate of Change $\Delta y / \Delta x$
2–10 years				
18–20 years				

10. Compare the unit rates of change (slopes) of the two sections of the graph.

11. Based on the unit rates of change, when do children grow at the greatest rate—between 2 and 10 years of age or between 18 and 20?

12. Using mathematics and referring to your graph and the unit rate of change between ages 18 and 20 years, what would you say to a person who, at age 19, stated that they hope to grow another 6 cm (about 2 ¼ inches) by the time they are 23 years old? Justify your answer.



