

Scientific Method Investigation

Name _____ Date _____ Period _____ Group _____

In this investigation you will be learning about the different steps of the Scientific Method and how they fit together. You'll be doing this by making observations of something you are already familiar with, yourself.

Materials: Metric ruler, Meter stick
 Yourself
 Graph paper
 Calculator

Problem: Are there specific ratios that exist between the lengths of certain parts of the body and other parts?

Hypothesis: _____

Procedures: Using your metric ruler, measure and record the lengths of the parts of your body that appear in the chart below. You will then plot the data on graph paper and determine if any patterns or trends in the data exist. Record all measurements in centimeters while applying the estimation rule (to the nearest .01cm).

Variables: Before actually starting the lab, you need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.

Independent Variables: _____

Dependent Variables: _____

Controlled Variables: _____

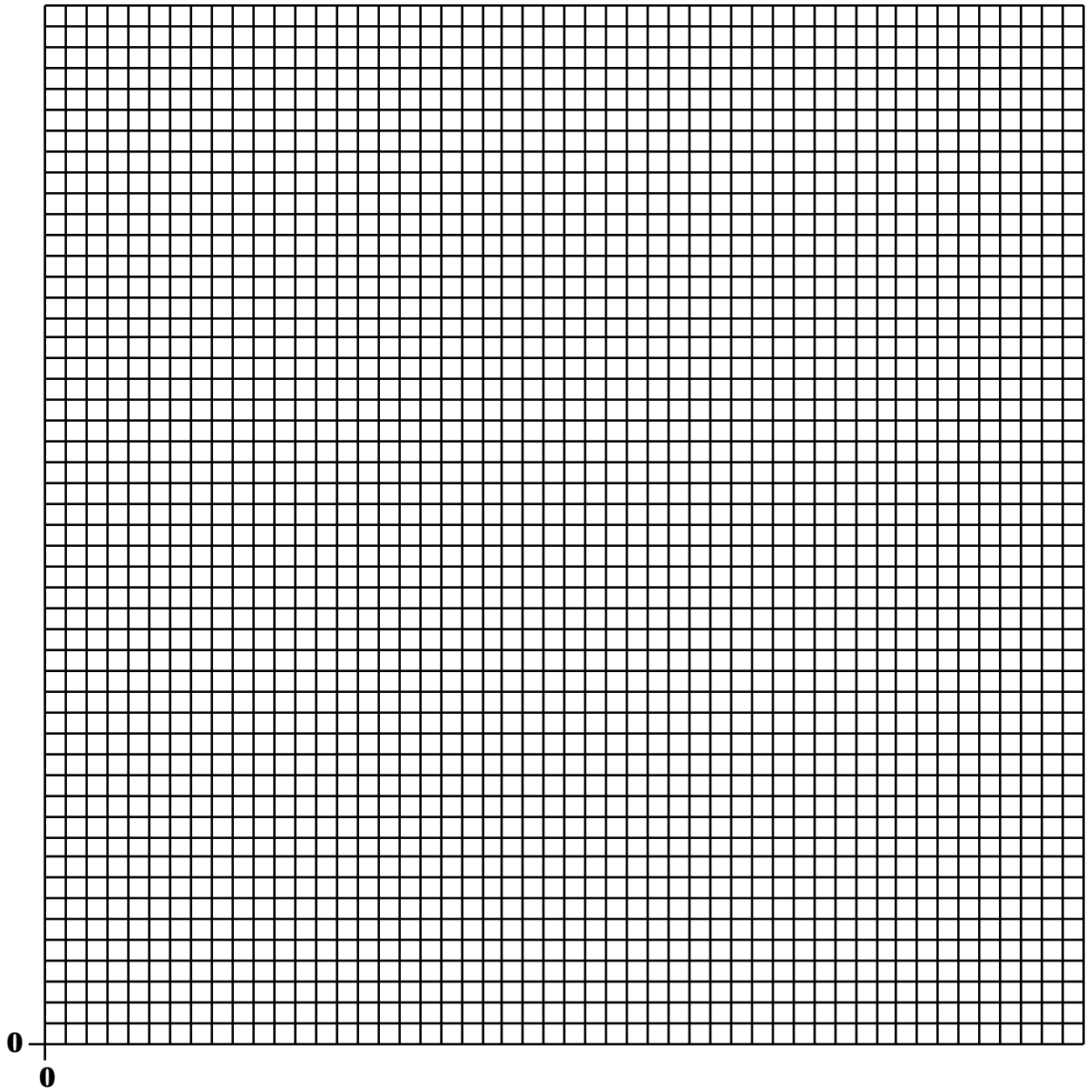
Subject	Length of index finger	Length of Hand Span from thumb to pinky tip	Length from wrist to elbow (forearm)	Length of foot	Height (without shoes)	Length between outstretched arms (arm span)	Width of tibia (while sitting)
Yourself							
Partner							

Graphing Data: 1–The first type of graph you'll be constructing is a scatter graph. Label the axis' of the graph paper according to your teacher's directions. Then, carefully plot on the graph, the data from you as well as the other students papers. (This data will be placed on the board for you to copy down) . Does the data align itself in one general area, or does it form a curve or straight line? These as well as other types of patterns or trends may be seen in the data you've plotted.

Answer the question below after constructing the graph!

Question 1 .What is the **general** pattern or trend associated with the graph ?Does the data align itself in one general area, or does it form a curve or straight line?

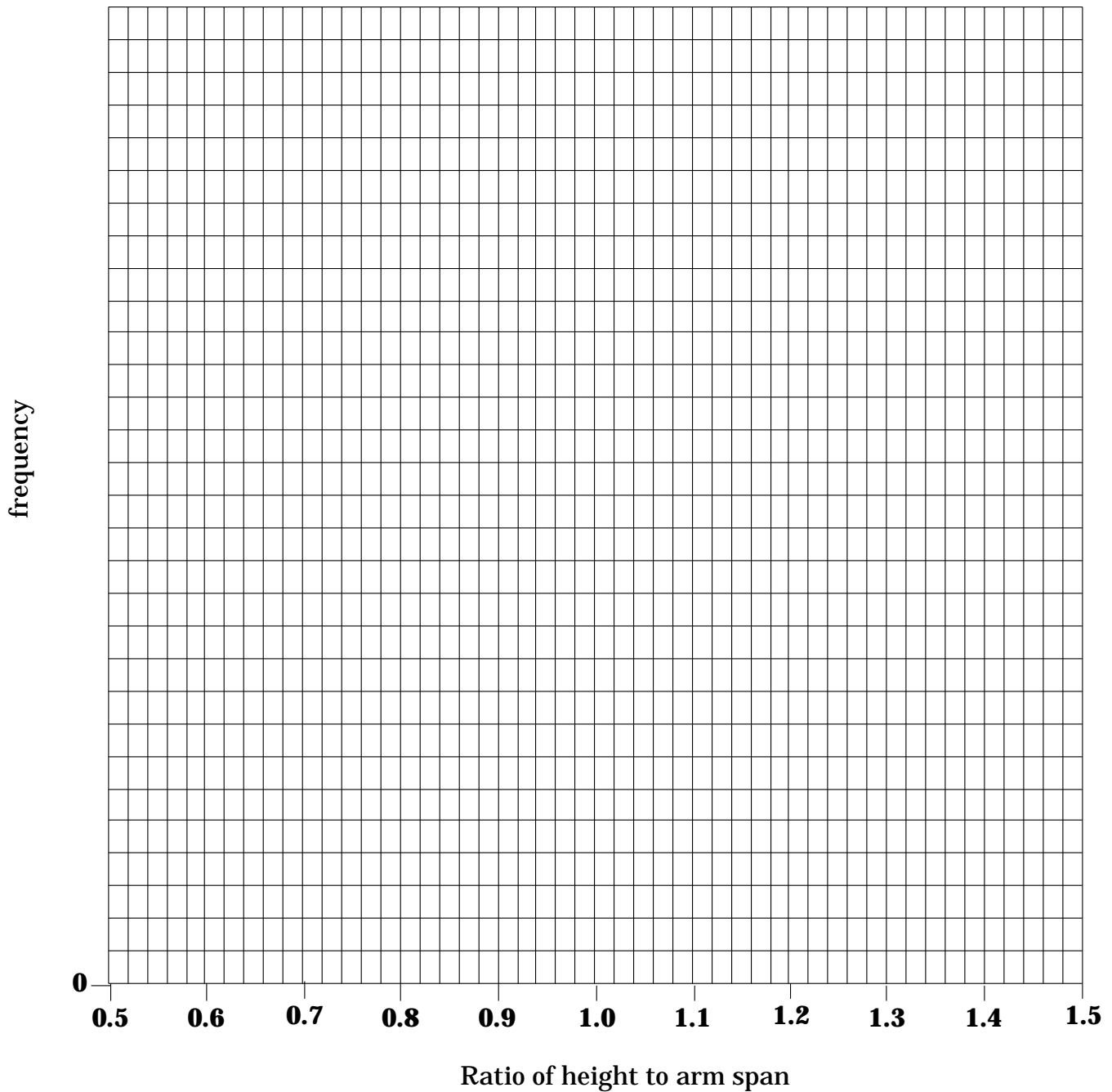
Forearm length in centimeters



Height in centimeters

2- The second type of graph you'll construct is a histogram, which shows how *often* certain data occurs. A histogram is a type of bar graph. To do this graph, you'll need to do some calculations first. **Using the data in the chart on page 1, calculate the following ratios and record them to the number of decimal places your teacher wants.**

Subject	Ratio of height to forearm length (\circ)	Ratio of hand span to tibia width (\square)	Ratio of height to arm span (Δ)	Ratio of foot length to index finger length (u)
Yourself				
Partner				



Answer the question below after constructing the graph!

Question 2. Which ratios on the histogram seem to be most common?

Question 3. If someone told you just their arm span, explain why you could use that information to determine their height? Be specific!

Overall Conclusion Briefly answer the hypothesis stated earlier, using the best information collected during the experiment to support your answer. If your answer to the problem was incorrect, give the correct answer, again using the best information collected during the experiment to support your answer. **Explain your reasoning!**

Sources of Error Identify *two* things that people may have done incorrectly that would have caused them to get totally different answers from the rest of the class. These errors must be unique, in other words they have not been applicable in previous labs. They must be *new* sources of error. Be *specific* about what might have been done.
