

Scientific Method Superstition

Introduction:

Humans try to explain what is going on around them; this is a product of a properly functioning brain. It is called curiosity. Centuries ago and even today human curiosity is at work. The answers to many of the proposed questions comes from our ability to observe, process the information, and then reach some kind of a conclusion. In many cases our conclusions are not the best, well thought out ones, but we keep them just the same. Many of these underdeveloped conclusions are commonly called superstitions. In this lab we are going to examine what makes a valid conclusion.

Objectives:

- The students will be able to test a hypothesis to determine its validity.
- The students will demonstrate their knowledge of using the Scientific Method to develop conclusions based on data received from an experiment.
- Students will show their data in the form of tables and a line graph.

Materials:

- metric ruler (see end of lab)
- meter stick
- scissors
- string

Procedures:

Head Measurement:

Many scientific studies have been conducted to determine if a relationship exists between the circumference of a person's head and their height. Another commonly held idea is that if you measure your middle finger and multiply it by three, it will give you the length of your forearm. In this lab **we are going to test the first of these superstitions and determine if it is true.**

1. Before we begin to collect data, a hypothesis needs to be formed. Write your hypothesis in the space below:

2. There is an idea that if you measure the circumference of your head and multiply it by three, it will give you your height. Choose a partner and, with a piece of string, measure the circumference of their head in centimeters (cm). Measure it at the widest point of the head. After completing the measurement use the meter stick to measure the length of the string. Now have your partner do the same to you. Record both your measurements in **Table 1**.

3. Have your partner measure your height in cm. **Make sure you remove your shoes.** Place this data in Table 1. Now do the same for your partner.

Table 1. Group Data on the Circumference of the Head.

Name _____	Times (3)		POSSIBLE height (cm)	ACTUAL height (cm)	Difference between circumference and height measurements
circumference of the head _____ cm.	X	=	_____cm.	_____cm.	_____cm.
Name _____					
circumference of the head _____ cm.	X	=	_____cm.	_____cm.	_____cm.

Class Data:

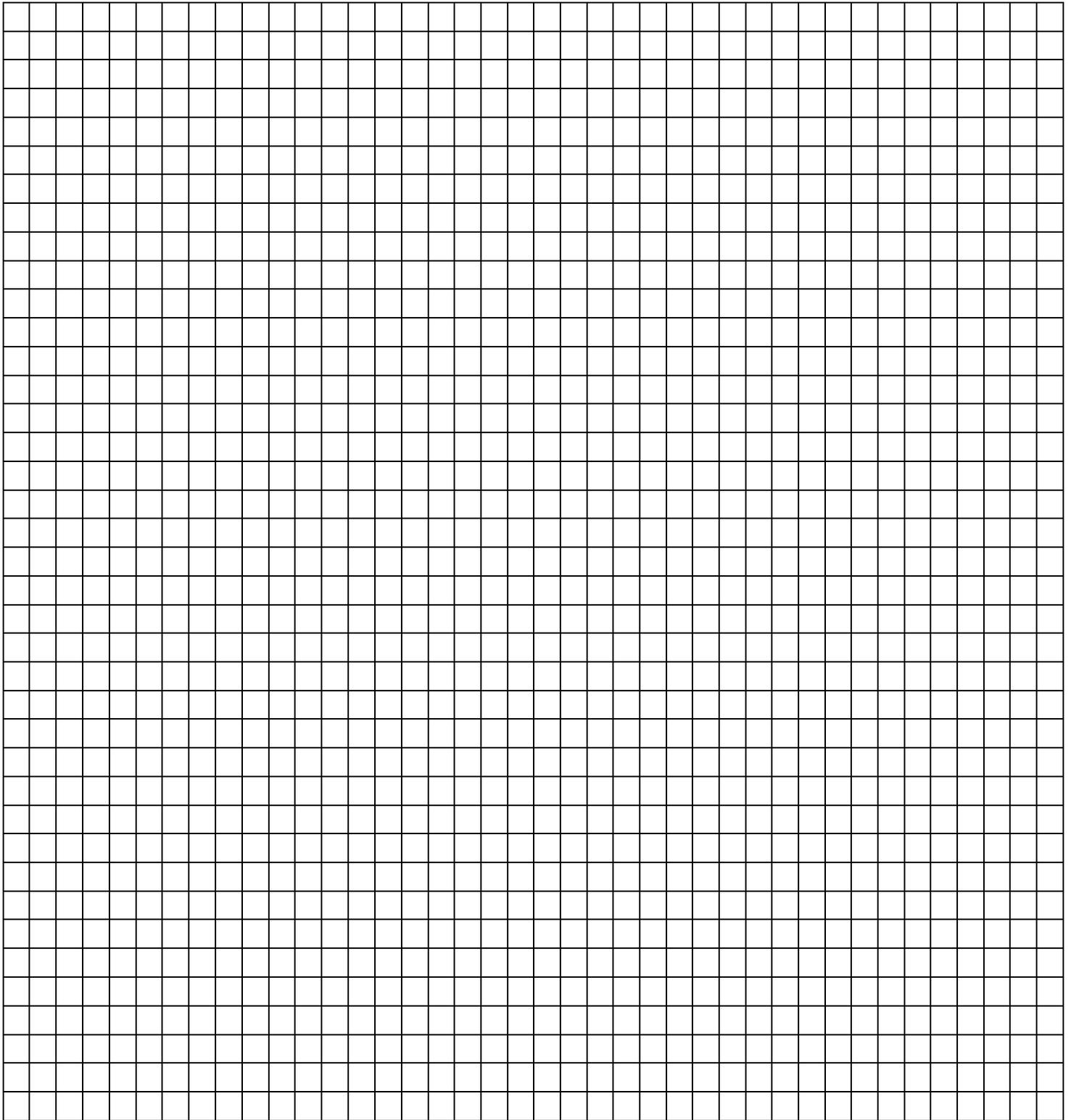
After the entire class has completed **Table 1**, have the students record their data on the chalk board in the front of the room. Use **Table 2** below to record the data for later use.

Table 2: Class Data on Head Circumference and Height.

Student	Gender (M / F)	Circumference (cm) X 3	Height (cm)	Difference between circumference and height measurements
1.	M / F			
2.	M / F			
3.	M / F			
4.	M / F			
5.	M / F			
6.	M / F			
7.	M / F			
8.	M / F			
9.	M / F			
10.	M / F			
11.	M / F			
12.	M / F			
13.	M / F			
14.	M / F			
15.	M / F			
16.	M / F			
17.	M / F			
18.	M / F			
19.	M / F			
20.	M / F			

In order to form a more accurate conclusion, the collection of additional data is necessary. The teacher has the option to include the data from all the classes running this experiment.

Graph the data from Table 2. AND then answer the questions that follow. Be sure to include a title, and the proper variables on the proper axis (“Y” be dependent when you can be “X”remely independent)



Analysis:

1. Examine the above graph. What is the shape of the line for head circumference? _____

2. Examine the above graph. What is the shape of the line for height ? _____

3. Are the shapes of the two lines the same? _____

4. If not, how do they differ? _____

5. Did any of the subjects have the head measurement X 3 exactly equal their height? _____

6. If so, how many? _____.

7. What was the average difference between both measurements for the entire class? Add all the values for the difference in circumference and height and divide by the number of students in class. _____

8. Based on the above collected data, does it support or refute your hypothesis? _____

9. Explain. _____

10. What variables may have affected the results obtained in this experiment? _____

