Name:_____

Lab Exercise 4 Biface Analysis

Objectives

In this lab you will analyze a sample of bifaces, record both metric and non-metric attributes, and describe them with descriptive statistics including the mean, variance, standard deviation and coefficient of variation. The purpose of this is for you to learn some of the basic approaches of technological analysis which are important for learning about patterns of prehistoric behavior.

Materials

1. Bifacial artifact samples
2. Calipers
3. Lithic raw material and artifact displays
3. Scientific hand calculator

Grading

The point allocations are shown for each task and question. Total =75 points

Instructions

First, using the criteria in this lab exercise, sort your biface sample into the four classes. Now fill out the Biface Coding Form (p. 49), starting with roughouts and ending with tools.

NOTE: You will also have to examine and answer some questions about the lithic raw material and artifact samples, so do this soon after you finish sorting the bifaces and entering data into the Biface Coding Form.

1. Calculate the frequencies of your biface classes (***5 points***)

Roughouts _____%
Preform I _____%
Preform II _____ %
Tools _____%

2. List the metric and non-metric characteristics for each class that were most important in classifying them: (***10 points***)

   Roughouts:

   Preform I:

   Preform II:

   Tools:

3. Which classes were hardest to distinguish? Why? (***5 points***)

4. Use the graph paper supplied on p. 50, and create a *scatterplot* of the width-thickness ratio (W/T) and the thickness data from your Biface Coding Form. Plot each artifact, using the symbols shown below for each of the four classes: (***10 points***)
   - ● Roughouts
   - ♦ Preform I
   - ◊ Preform II
   - Δ Tool

5. Do you see a relationship, for the whole assemblage between size (thickness) and shape (W/T ratio) during the reduction from roughout to tool? In statistical terms this asks if there is a correlation between size and shape between these variables (that is as one variable increase, so does the other). (***10 points***)

6. If the first two classes of artifacts (Roughouts and Preform I) were manufactured at a lithic quarry site where the raw materials was acquired, and the last two stages (Preform II and Tool) were manufactured at a nearby camp site, what would you expect the debitage at those two sites to look like in terms of the size and cortical amount on flakes? Why? (***10 points***)

   Predicted Quarry Site Debitage Characteristics

   Predicted Camp Site Debitage Characteristics

7. Next, go back to your **Biface Coding Form** (p. 49) and do the following (***10 points***):

   a. Calculate Mean Thickness

   b. Calculate Mean Width/Thickness Ratio

   c. Calculate the sum of squared differences from the mean [$(x - \bar{x})^2$] for Thickness and W/T Ratio

   d. Calculate the Variance for Thickness and W/T Ratio. NOTE: Recall the formula for variance, which is the average for the differences from the mean (that you did in task c), except that you divide the sum of those differences by (n-1) instead of n.

   e. Calculate the Standard Deviation for Thickness and W/T ratio (recall it is the square root of the variance)

   Show the variance and the standard deviation for these:

	Variance (σ^2)	**St. Dev.** (σ)
Thickness		
W/T Ratio		

   Divide the standard deviation by the mean to get the coefficient of variation (CV) for thickness and width-thickness ratio:

	St. Dev. (σ)	**Mean**	**CV**
Thickness			
W/T ratio			

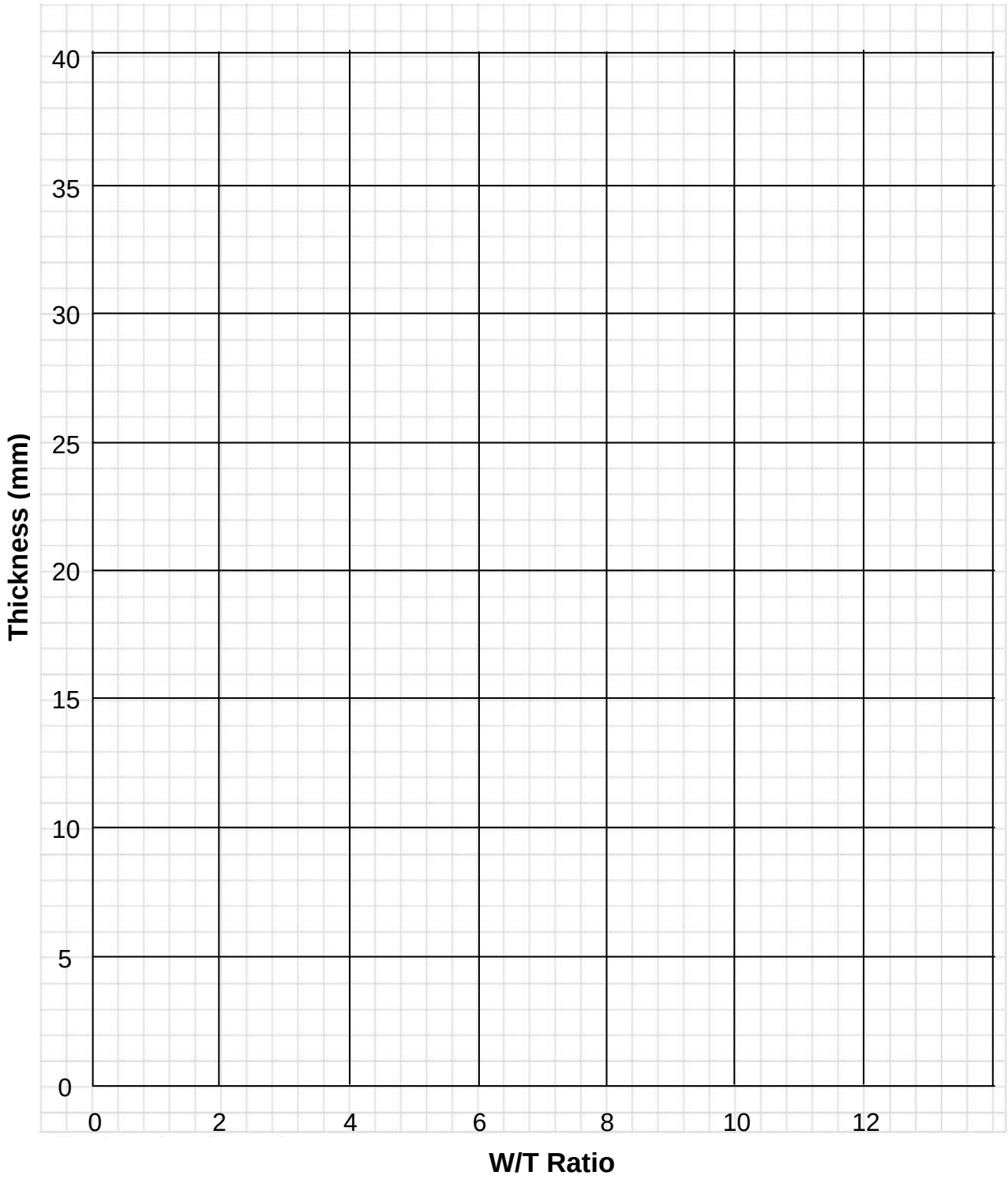
8. Compare the CV for thickness and W/T Ratio. Using this index, assess which aspect of the assemblage is *most variable* (i.e. has the largest CV value)? (***5 points***)

9. Look again at the scatterplot of your biface data. Which classes of bifaces contributed most to the size (thickness) and shape (W/T) variability? Explain this in terms of the reduction process which moves from natural raw material size and shape to finished tool size and shape. (***10 points***)

Biface Coding Form **Kit #_____**

For Class: 1=Roughout; 2=Preform I; 3=Preform II; 4=Tool

Artifact #	**Class (1-4)**	**Cortex (Y/N)**	**Width (mm)**	**Thick (mm)**	**Thick** $(X-\overline{X})^2$	**Width/Thick**	**Width/Thick** $(X-\overline{X})^2$
Sum							
Mean							
Variance							


Thickness (mm)
40
35
30
25
20
15
10
5
0
0
2
4
6
8
10
12
W/T Ratio