Name \_\_\_\_\_

Date \_\_\_\_\_

### Forensic Anthropology—Determining Stature

Forensic Science, The Basics

#### Background

Forensic anthropology involves the identification of human remains using the bones to determine ancestry, age, stature and gender. If enough bones and certain key bones are available (skull, pelvis, long bones), the task can be uncomplicated. When only a few bones are available the identification can become difficult and only a few aspects of the decedent can be determined. In this activity the long bones of the body will be used to estimate stature.

#### **Materials**

- Metric tape measure
- Calculator
- Table 11.1
- Table A

#### Procedure

- 1. Two students must work together in this activity.
- 2. Measure the approximate length (in centimeters) of your partner's the humerus, ulna, femur and tibia. Refer to the diagram (figure 11.1) in Chapter 11 as to the location of these bones.
- 3. Record your values in Table A.
- 4. Using the formulas from Table 11.1, and the correct race and gender category, calculate an approximate height.
- 5. Average the values in step 4 and determine an approximate height range in feet and inches.
- 6. Use the tape measure to determine the actual height of your partner and record it in Table A.

CRC Press/Taylor & Francis, 2010

Lab Activity

| Race/Sex         | Formula (cm)           | Standard Deviation |  |  |
|------------------|------------------------|--------------------|--|--|
| Caucasian Male   | 2.89 * humerus + 78.10 | ±4.57              |  |  |
|                  | 3.79 * radius + 79.42  | ± 4.66             |  |  |
|                  | 3.76 * ulna + 75.55    | ±4.72              |  |  |
|                  | 2.32 * femur + 65.53   | ± 3.94             |  |  |
|                  | 2.42 * tibia + 81.93   | $\pm 4.00$         |  |  |
|                  | 2.60 * fibula + 3.86   | $\pm 3.86$         |  |  |
| Caucasian Female | 3.36 * humerus + 57.97 | ± 4.45             |  |  |
|                  | 4.74 * radius + 54.93  | ± 4.24             |  |  |
|                  | 4.27 * ulna + 57.76    | ± 4.30             |  |  |
|                  | 2.47 * femur + 54.10   | ± 3.72             |  |  |
|                  | 2.90 * tibia + 61.53   | ± 3.66             |  |  |
|                  | 2.93 * fibula + 59.61  | ± 3.57             |  |  |
| African Male     | 2.88 * humerus + 75.48 | ±4.23              |  |  |
|                  | 3.32 * radius + 85.43  | ±4.57              |  |  |
|                  | 3.20 * ulna + 80.77    | ± 4.74             |  |  |
|                  | 2.10 * femur + 72.22   | ± 3.91             |  |  |
|                  | 2.19 * tibia + 85.36   | ± 3.96             |  |  |
|                  | 2.34 * fibula + 80.07  | $\pm 4.02$         |  |  |
| African Female   | 3.08 * humerus + 64.47 | ± 4.25             |  |  |
|                  | 3.67 * radius + 71.79  | $\pm 4.59$         |  |  |
|                  | 3.31 * ulna + 75.38    | $\pm 4.83$         |  |  |
|                  | 2.28 * femur + 59.76   | $\pm 3.41$         |  |  |
|                  | 2.45 * tibia + 72.65   | $\pm 3.70$         |  |  |
|                  | 2.49 * fibula + 70.90  | $\pm 3.80$         |  |  |
| Asian Male       | 2.68 * humerus + 83.19 | ±4.16              |  |  |
|                  | 3.54 * radius + 82.00  | $\pm 4.60$         |  |  |
|                  | 3.48 * ulna + 77.45    | $\pm 4.66$         |  |  |
|                  | 2.15 * femur + 72.57   | ± 3.80             |  |  |
|                  | 2.39 * tibia + 81.45   | ± 3.27             |  |  |
|                  | 2.40 * fibula + 80.56  | $\pm 3.24$         |  |  |

#### **Table 11.1:** Stature for Males and Females, Various Ethnic Groups

Source: Forensic Anthropology Training Manual; Karen Ramey Burns, 2007

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# Table A: Data Table

| Name of | Length of | Height Range   | Height   | Calculated   | Average | Measured |
|---------|-----------|----------------|----------|--------------|---------|----------|
| Student | Bone (cm) | in Centimeters | Range in | Height Range | Height  | Height   |
|         |           |                | Inches   |              |         |          |
|         | humerus   |                |          |              |         |          |
|         |           |                |          |              |         |          |
|         | ulna      |                |          |              |         |          |
|         |           |                |          |              |         |          |
|         | femur     |                |          |              |         |          |
|         |           |                |          |              |         |          |
|         | tibia     |                |          |              |         |          |
|         |           |                |          |              |         |          |
|         | numerus   |                |          |              |         |          |
|         | ulaa      |                |          |              |         |          |
|         | ullia     |                |          |              |         |          |
|         | femur     |                |          |              |         |          |
|         | Ternur    |                |          |              |         |          |
|         | tihia     |                |          |              |         |          |
|         |           |                |          |              |         |          |
|         |           |                |          |              |         |          |

## Follow Up

1. Calculate the percent difference between the long bone measurements and the actual height.  $Percent difference = \frac{accepted - experimental}{accepted} \times 100\%$ 

2. List possible sources of error in this activity.