Blizzard Bag Days 1-3 TechSci Body Measurement Lab

OBJECTIVE

This activity offers an experience in:

- Metric measurement
- Obtaining lengths of body parts
- Inferring height from various long bone lengths
- Developing bone/height relation charts

Inferring Height

Your upper leg contains a large, single bone called the femur. This long bone stretches from the hip (pelvis) socket to the kneecap (patella). The length of this bone can be used to roughly estimate a person's height. To increase accuracy of this bone-to-height relationship, you will also need to know both the gender and race of the individual. These factors affect the relationship between long bone length and the individual's height.

MATERIALS

- Tape measure OR meter stick and string
- Calculator

PROCEDURE Day 1-Inferring Height from Femur Length

- 1. Work with a partner. Identify the placement of each person's femur bone. It is the single large bone that extends from the hip socket to the kneecap.
- 2. Use a measuring tape to determine the approximate length of this bone (in centimeters).
- 3. Multiple the length of the femur by 2.6.
- 4. Add 65 to this number to arrive at the approximate height of your partner in centimeters.
- 5. Use a measuring tape to obtain the actual height of each person in centimeters.
- 6. If you'd like to see these two numbers in inches, convert this metric measurement by dividing by 2.54.



Day 2-Inferring Height from Humerus Length

- 1. Work with your partner. Identify the placement of each person's humerus bone. It is the single large bone that extends from the elbow to the shoulder socket.
- Use a measuring tape to determine the approximate length of this bone (in centimeters). If the bone comes from a female subject, go to step 3. If the bone comes from a male subject, go to step 5.
- 3. If the bone comes from a male subject, go to step 5. 3. If the bone comes from a female, multiply the measured length in centimeters by 3.06.
- 4. Add 64.26 to this number. This final number is the approximate height of the female based upon her humerus length.
- 5. If the bone comes from a male, multiply the measured length in centimeters by 3.269.
- 6. Add 59.41 to this number. This final number is the approximate height of the male based upon his humerus length.

Day 3-Inferring Height from Tibia Length

- 1. Work with your partner. Identify the placement of each person's tibia bone. It is the larger central bone of the lower leg, extending from just below the kneecap to the ankle.
- 2. Use a measuring tape to determine the approximate length of this bone (in centimeters).
- 3. Use the chart below to estimate the height of your partner based upon the tibia length. This regression chart uses only three racial stocks, European, African and Asian descent.



European Descent male	(2.42)	(tibia length in centimeters) + 81.93
European Descent female	(2.90)	(tibia length in centimeters) + 61.53
African Descent male	(2.19)	(tibia length in centimeters) + 85.36
African Descent female	(2.45)	(tibia length in centimeters) + 72.56
Asian Descent male	(2.39)	(tibia length in centimeters) + 81.45
Asian Descent female	not available	

Multiply Add this number

Day 1-3 Analyzing Your Results

Day 1. Create a data table to organize all the measurement data that will be obtained in Days 1-3. REMEMBER TABLE CRITERIA – headings, units for numbers, etc.