Forensic Science   Name: _____   Period: _____
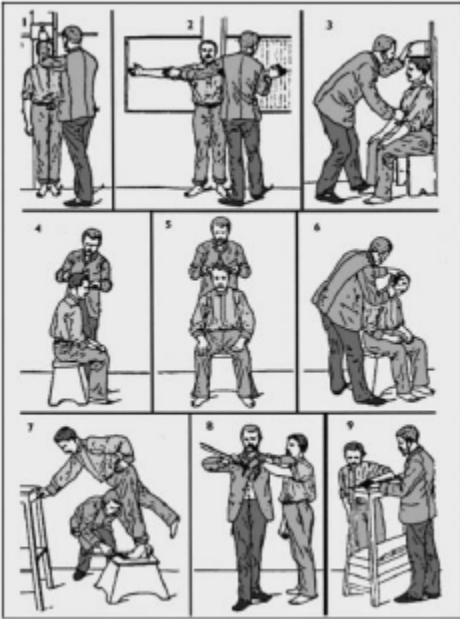
Bertillon Measurement System

Prior to modern technologies, after a criminal was caught, there was absolutely no way to tell if the person had a history of criminal activity, or if he was wanted for crimes elsewhere. As a result, it was nearly impossible to enforce any laws regarding repeat offenders of any crime. Today we use fingerprinting and DNA information, but before these were discovered as a means of identifying criminals, the Bertillon system of measurement (also known as **Bertillonage**) was considered the most reliable means of identifying an individual person. Named after its creator during the second half of the 19th century, **Alphonse Bertillon** was a police department file clerk in Paris; he developed this complex method of measuring and categorizing individuals. The roots of the Bertillon system are in the field of **anthropometry**, a system of precise body measurements. The thought being that no one individual would have the same combination of body measurements as another, or at least the possibility would be negligible. Bertillon had calculated that the probability of two people having precisely the same 11 measurements was one in four million. A criminal might wear a fake beard or give a phony name, but Bertillon noted that "subjects cannot exercise the slightest influence on their cranium diameters."

Bertillon's system of identification included three categories of information: body measurements, morphological descriptions, and a description of any marks on the body such as birthmarks, scars, and tattoos. He developed a filing system that put a person in one of three main categories based upon head size. He then subdivided them further according to the dimensions of the left middle finger, and so on down the line, using 11 different bodily measurements. It may seem archaic now but before the adoption of fingerprinting early in the 20th century, this system was at the forefront of evidence collection and recording keeping protocols. In French courts, where suspects were guilty until proven otherwise, proof of a past criminal record was a powerful tool for winning convictions, and Bertillon's star rose. In 1892 he was appointed director of the newly formed Bureau of Identification of the Paris police.

Alphonse Bertillon

Pre-Lab Questions:

1. What are the two main methods of criminal identification today?

2. What is anthropometry?

3. What is the probability of two people having precisely the same 11 measurements?

4. Bertillon's system of identification included what three categories of information?

Objectives:

- Collect various anthropometric data in metric units
- Compare and analyze different sets of measurements
- List two sources of experimental error when using measured data
- Understand Bertillonage and its importance in Forensic History

Directions: Working with a partner or small group, take each other's measurements and complete your own anthropometry sheet on the next page. **Use metric**! (1 inch = 2.54 cm). Use a meter stick, ruler, and calipers for the following measurements. Numbers should be written to the nearest hundredth when possible. If you need help on how to take the measurements, reference the appendix at the end of this assignment.

1. Write your name in Column 1("Characteristics of") in the chart on pg. 4.
2. On top of column 2, print the name of your lab partner who will take the first set of measurements in centimeters (cm). On top of column 3, print the name of the lab partner who will take the second set of measurements in cm. On top of column 4, print the name of the lab partner who will take the third and final set of measurements in cm.
3. Work in groups of 4. Record the following for each student in your group:
   a. Length of left foot without shoe
   b. Length of right ear
   c. Width of right ear
   d. Circumference of head
   e. Circumference of right wrist
   f. Length of left middle finger
   g. Length of left little finger
   h. Length from left elbow to end of middle finger
   i. "Wingspan" measurement – tip of left middle finger to tip of right middle finger
   j. Height
   k. Length of trunk
4. Students 'B', 'C', and 'D' will measure student 'A' independently. Students 'A', 'C', and 'D' will measure student 'B'. Students 'A', 'B', and 'D' will measure student 'C', and Students 'A', 'B', and 'C' will measure student 'D'. Thus, each person should have three separate sets of recorded measurements.

Analysis Questions: Using your results, background information above, Unit 1: Introduction to Forensics slides, answer the following questions.

1. What is the Bertillon System of Measurement? Answer in your own words.

2. Is the Bertillon System of Measurement effective? Why or why not?

3. Find someone in the class you feel is close to your overall size. Compare your data to their data.

    a. What is their name?

    b. What measurements did you have that were similar (within 5 mm or .5 cm of each other)?

    c. What measurements did you have that were different (over 5 mm or .5 cm apart)?

4. Name two factors that could cause error in the measurements taken.

5. Would you consider this the best method of human classification? Support your answer with at least two reasons.

6. Read the scenario outlined/linked on slide -~80-81 on the **Unit 1: Introduction to Forensics** Google Slides presentation. Was Will West the same person as William West? Use evidence to support your answer.

ANTHROPOMORPHIC MEASUREMENTS - Lab 1

Characteristics of: _____	Measurements (cm) by: _____	Measurements (cm) by: _____	Measurements (cm) by: _____
Length of left foot without shoe			
Length of right ear			
Width of right ear			
Head Circumference			
Circumference of right wrist			
Length of left middle finger			
Length of left little finger			
Length from left elbow to end of middle finger			
Wingspan – Outstretched reach of both arms			
Full Body Height			
Length of trunk			

Appendix: How to take your measurements

- **Height**- Take off your shoes. Stand against a wall and use a flat surface to mark the top of your head. Measure to that mark.
- **Outer arm stretch**- Hold your arms straight out to your sides. Have your group measure from your right middle fingertip to your left middle fingertip. Helpful if you use string then measure the string.
- **Trunk**- Sit in a chair. Measure from the chair to the top of your head. Do not slouch.
- **Head length**- Measure from the back of your head to front of your head
- **Head width**- Measure the width of your head from above your left ear to above your right ear.
- **Right cheek**- Measure from the side of your right nostril to the side of your face.
- **Right ear**- Measure from the top of your right ear to the bottom
- **Left foot**- Take off your shoes (socks are ok for this activity). Measure from the back of your foot to the front of your foot (longest toe).
- **Left middle finger**- Bend finger so that it is at a 90 degree angle perpendicular to your hand, while still keeping your finger straight. Measure from behind the knuckle to the tip of the left middle finger.
- **Left little finger**- Bend finger so that it is at a 90 degree angle perpendicular to your hand, while still keeping your finger straight. Measure from behind the knuckle to the tip of the left little finger.
- **Left forearm-** Bend left arm to a 90 degree angle. Measure from the back of your elbow to the tips of your fingers.