Bertillonage

Topic

Body measurements and eye color

Introduction

In 1882, Alphonse Bertillon, Director of the Identification Bureau of the Paris Prefecture of Police, developed a system known as Bertillonage that enabled the French authorities to identify known criminals. The United States adopted his system in 1887. Before Bertillon's work, such identification had been difficult and had relied on descriptions and some photographs. This made police records time-consuming to use and their storage cumbersome. Bertillon's system relied on the premise that the measurements of specific parts of a person's body gave a unique record of his or her identity. Following this system, police forces built up a system of such records, enabling them to track and identify criminals if they re-offended. These measurements also had the advantage of being rapid and easy to transmit by telegraph if it was necessary to identify a suspect quickly. In this experiment, you will make some typical measurements that would have been part of the Bertillon system and then pretend to identify a "criminal" from your measurements. You can make most of the measurements using a ruler, a tape measure, or a meter stick. However, the head measurements require calipers (see diagram 1 opposite), so you will make simple calipers in the first part of the experiment.

Calipers

Time required

Part A: 20 minutes
Part B: 1 hour

Materials

For Part A:
sheet of poster board (approximately 30 × 20 cm)
2 paper fasteners
hole punch
pencil
30 cm ruler
scissors
stapler

For Part B:
calipers from Part A
meter stick
30 cm ruler
tape measure
sharpened No. 2 pencil
hardback book
stool
chair
table
index card

Safety note

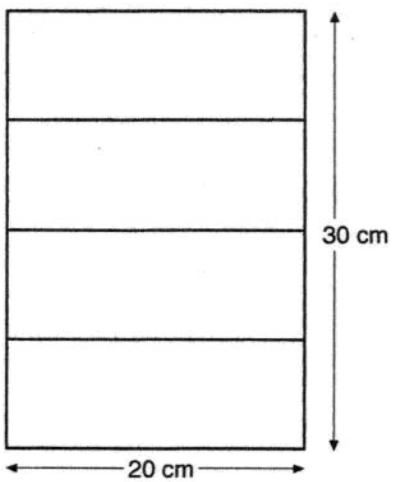
Please read the general safety precautions at the beginning of the book.

Procedure

If you have calipers, you can omit Part A. You will need a partner for Part B of the experiment. You will need results from the whole class for the analysis.

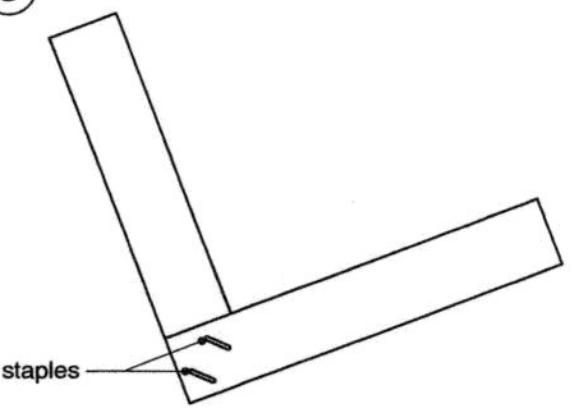
Part A: Making the calipers

2



Lines marked on the sheet of poster board

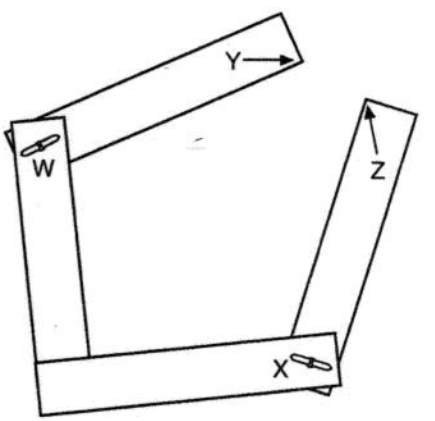
3



Two pieces of poster board forming an "L" shape

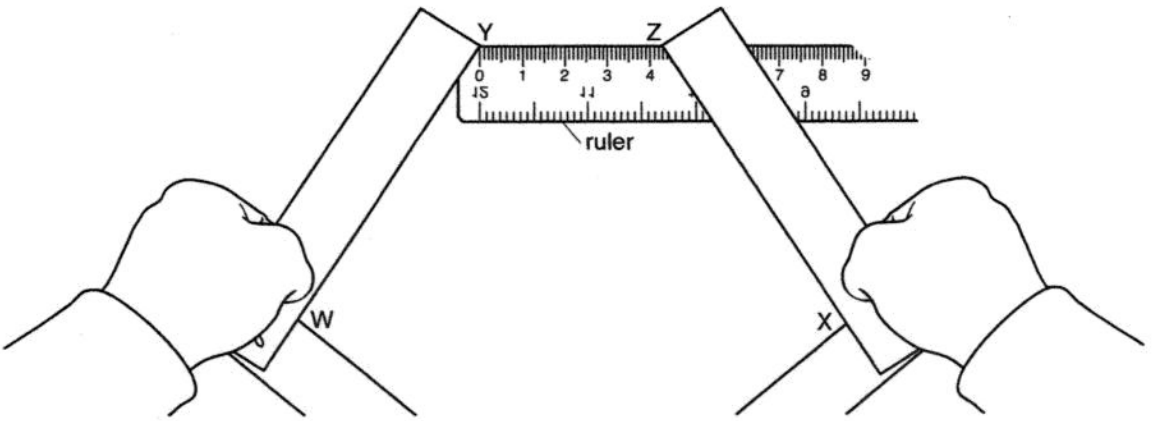
1. Using the ruler and pencil, mark three evenly spaced lines on the sheet of poster board as shown in diagram 2 above. Then cut the poster board along these lines to form four pieces.
2. Fold each of the four pieces of poster board in two along their length and staple the edges together at each end.
3. Fit two of the folded pieces of poster board together and staple them to form an "L" shape as in diagram 3 above.
4. Use a hole punch to make holes in the ends of the "L" shape and in one end of each of other two pieces of folded poster board. Use paper fasteners to attach the two lengths of folded poster board to the L-shaped piece as in diagram 4 opposite.
5. To use the calipers, place the object you are measuring between points Y and Z (in diagram 4 opposite). Hold the pieces of poster board together at W and X, so as to keep points Y and Z spaced correctly and measure the distance Y – Z using a ruler (as in diagram 5 on the next page).

4



Four folded lengths of poster board connected together to form calipers

5



Using the calipers to make a measurement

Part B: Making the measurements

For this part of the experiment, you should work in pairs with Person B measuring Person A. Make all measurements in centimeters.

Height

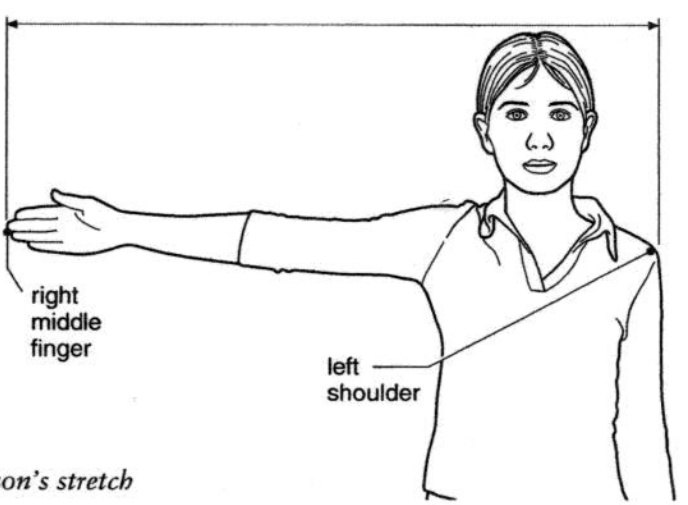
1. A takes off his shoes and stands against a wall. B places a book on A's head. After making sure that the book is level and the exact top of the head, B uses the pencil to mark the position of the underside of the book with a pencil (top of A's head) on the wall.
2. A moves away from the wall, so that B can use the tape measure to measure the distance (in cm) between the floor and the mark. This distance is A's height. Record the value in the appropriate row of the data table on page 3.01–7.

Stretch

This is the length from the left shoulder to the right middle finger when the arm is raised (see diagram 6 below).

3. A stands against a wall and holds out his right arm until it is horizontal.
4. B marks the position of A's left shoulder and the tip of his right middle finger on the wall.
5. A moves away from the wall, so that B can measure the horizontal distance (in cm) between the two marks. Record the value in the row labeled "stretch" in the data table.

6



A person's stretch

Torso

This is the length of the torso from the top of the head to the base of the spine when seated.

6. Repeat step 1 but with A sitting on a stool beside a wall.
7. A moves away from the wall so that B can measure the distance between the top of the stool and the mark. Record the value in the row labeled "torso" in the data table.

(7)

Using the calipers to measure the length of a person's head

(8)

Using the calipers to measure the width of a person's head

Length of head (crown to forehead)

8. A sits on the stool. Using the calipers made in Part A, B touches point Y of the calipers on the crown of A's head and point Z on her forehead (see diagram 7 above).
9. While holding the calipers firmly at W and X to maintain the distance Y – Z, B measures the distance Y – Z by holding the calipers against the ruler. Record this distance (the length of the head) in the data table.

Width of head (temple to temple)

10. A sits on the stool. B touches point Y of the calipers on one side of A's forehead and point Z on the other side of her forehead (see diagram 8 above).
11. While holding the calipers firmly at W and X to maintain the distance Y – Z, B measures the distance Y – Z by holding the calipers against the ruler. Record this distance (the width of the head) in the data table.

Length of right ear

12. B uses the ruler to measure the distance between the upper rim and lowest point of the lobe of A's right ear. Record this distance (length of right ear) in the data table.

Length of left foot

13. A stands on her left leg, supporting herself by placing her left hand on the back of a chair as in diagram 9 below. B places a book behind A's heel and then uses the ruler to measure the distance to the end of A's big toe. Make sure that the ruler is touching the inside of the heel and the joint of the big toe. Record this distance (length of left foot) in the data table.

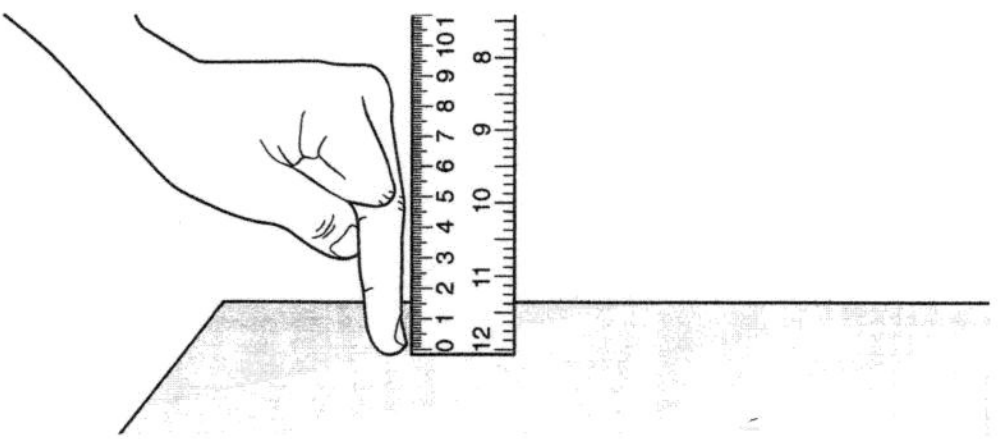
(9)

Measuring the length of the left foot

Length of left middle finger

14. A rests the tip of the middle finger of his left hand on a table, keeping the finger straight and bending back his hand so that the knuckle is prominent. Using a ruler, B measures the length of A's middle finger from the knuckle to the tip of the finger (see diagram 10 below). Record this distance (length of left middle finger) in the data table.

(10)



Measuring the length of the left middle finger

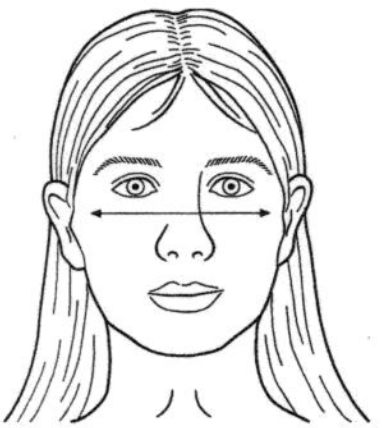
Distance from elbow to tip of middle finger

15. A leans over a table, resting his lower arm on the table. B holds a book behind A's elbow and, using the meter stick, measures the length between this and the tip of A's middle finger. Record this distance (elbow to tip of middle finger) in the data table.

Width of cheeks

16. B touches point Y of the calipers to the outer edge of A's right cheekbone and point Z of the calipers to the outer edge of A's left cheekbone (see diagram 11 below).
17. While holding the calipers firmly at W and X to maintain the distance Y – Z, B measures the distance Y – Z by holding the calipers against the ruler. Record this distance (width of cheeks) in the data table.

(11)



Width of cheeks

Length of left little finger

18. A rests his left hand on a table, holding up his little finger. Using the ruler, B measures the length of A's little finger from the knuckle to the tip of the finger. Record this distance (length of little finger) in the data table.

Color of left eye

19. B looks at A's left eye and records its color in the data table.
20. Copy the information in the data table onto an index card. Add A's name at the top.
21. If time permits, change places so that A now measures B.
22. Remove all pencil marks from the wall.

Analysis

1. Is your record identical with that of anyone else's in the group?
2. Put all the index cards together. Pretend you are trying to identify a "criminal" with the measurements given in Table 1 on the next page. Search through the records and try to find a match for these data. Is this easy?

Want to know more?

See Section 10: Our Findings

DATA TABLE	
Name	
Height	
Stretch	
Torso	
Length of head	
Width of head	
Length of right ear	
Length of left foot	
Length of left middle finger	
Distance from elbow to tip of middle finger	
Width of cheeks	
Length of left little finger	
Color of left eye	

Table 1. *"Criminal's" known Bertillon measurements*

Height	168 cm
Length of head	20 cm
Length of right ear	5.5 cm
Length of right foot	25 cm
Color of left eye	Blue