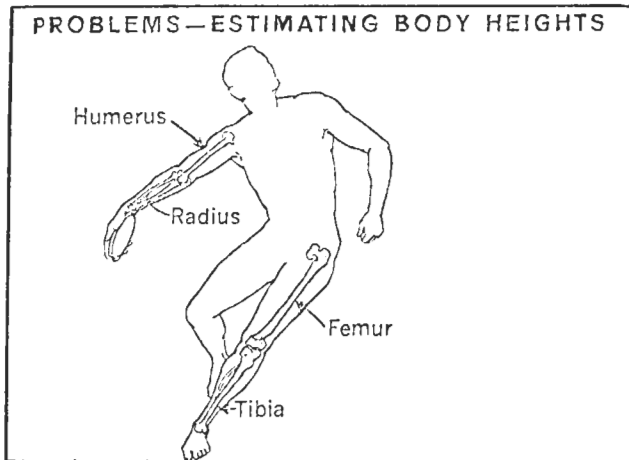


THE HUMAN BODY

(CONTINUED)



Anthropologists, using a single bone from a human skeleton, can estimate quite accurately the height of a man or woman who lived many centuries ago. For example, if an anthropologist finds a 27.94 cm radius from a caveman, he can estimate the height of the caveman as follows:

$$(3.271 \times 27.94) + 85.925$$

or 177.316 cm. Thus, the man was about 180 cm tall.

1. A 48 cm femur was found. About how tall was the man?
2. The length of a humerus bone from a woman who lived 20,000 years ago is 32.25 cm. What would be a good estimate of the woman's height (to the nearest centimetre)?
3. The skeleton of a Neanderthal man who lived about 50,000 years ago contained a tibia 38.1 cm long. Give an estimate of the man's height.

Height (centimetres)
Male
$(2.894 \times \text{length of humerus}) + 70.640$
$(3.271 \times \text{length of radius}) + 85.925$
$(1.880 \times \text{length of femur}) + 81.305$
$(2.376 \times \text{length of tibia}) + 78.663$
Female
$(2.754 \times \text{length of humerus}) + 71.476$
$(3.343 \times \text{length of radius}) + 81.224$
$(1.945 \times \text{length of femur}) + 72.845$
$(2.352 \times \text{length of tibia}) + 74.775$

4. A man is 181 cm tall. Using the table, accurately estimate the length of the bone from the knee joint to the ankle joint.
5. Measure, as accurately as you can, the length of the radius and humerus of an adult and check the accuracy of the table.
6. A student's height was found to be the same as the distance from fingertip to fingertip when his arms were outstretched. How much does your height differ from this distance?
7. One student's height in inches was 8.7 times the length of his middle finger measured to the nearest tenth centimetre. How much does your height differ from this distance?

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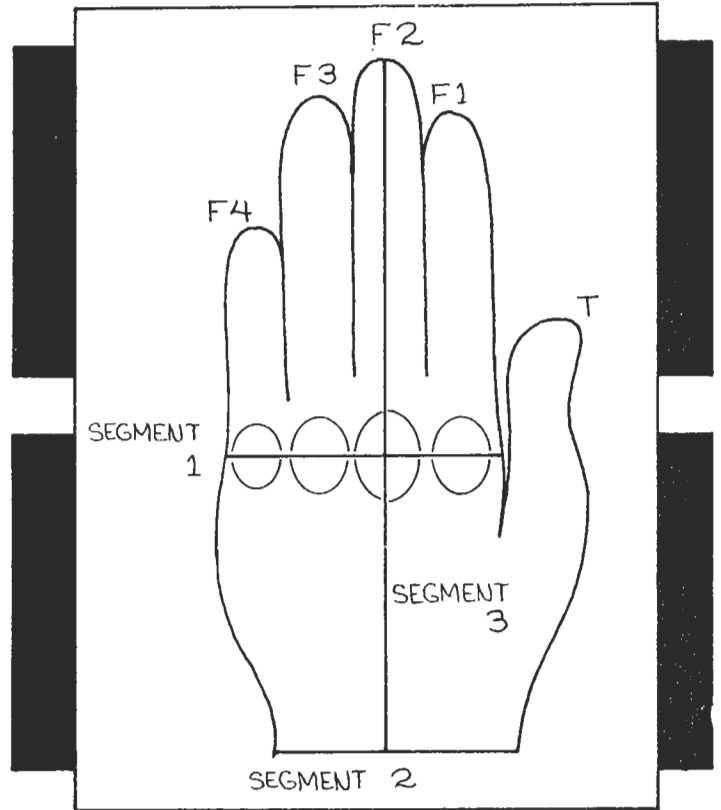
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HAND 'N' HAND ARM 'N' ARM

I.

- 1) Keep your fingers together and trace around one of your hands.
- 2) Draw line segment 1 across the knuckles.
- 3) Draw line segment 2 where the wrist begins.
- 4) Draw line segment 3 from the top of the longest finger to the wrist line segment.
- 5) Measure line segments 1 and 3 to the nearest centimetre.
_____ , _____
- 6) Find the ratio of the length of line segment 3 to the length of line segment 1.
- 7) Compare your ratio to your classmates. Are the ratios about the same? _____
- 8) Label the thumb T, the index finger F1, middle finger F2, ring finger F3 and little finger F4.
- 9) Is F1 longer, the same as or shorter than F3? Compare with your classmates.



II.

- 1) Place one end of a metre stick snugly against your armpit and measure the length your outstretched right arm.
- 2) Repeat measuring the left arm.
Right arm _____ cm Left arm _____ cm
- 3) How do the lengths compare?
- 4) What results did your classmates get?

IDEA FROM: *Modern Life Science*, by F. L. Fitzpatrick and J. W. Hole.
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Probing the Natural World, Volume 1, and *Investigating Variation*, Intermediate Science Curriculum Study