



FSP09 ANTHROPOMETRIC MEASUREMENTS

Teacher Background Information

Anthropometry refers to the study and measurement of body dimensions.

A trained anthropometrist is able to accurately measure lengths, widths, girths, height and the distance between anatomical points.

Anthropometry is used in the design of furniture and ergonomics: the relationship of humans to their work environment.

Anthropometry is also used in talent identification of athletes.

To be able to predict the dimensions of one body segment from another is extremely useful in forensic science. This may be estimating the height from partial remains of a skeleton or estimating height from a shoe or an impression left at a crime scene.

Anthropometric measurements can be affected by a variety of factors such as gender, age, socio-economic status, nutritional status and racial differences.

Accredited anthropometrists have been trained in the correct procedures.

There are currently four levels of anthropometry training. For more information on anthropometry go to the ISAK website for further details <http://www.isakononline.com>

Relationship between height and foot length

The relationship between height and foot length is approximately 15%.

Scientific studies using adults and children as subjects have verified that standing height (stature) is strongly correlated with foot length.

Foot length and shoe length

Foot length is however different to shoe length.

Shoeprint length and shoe size is positively correlated and increases linearly HOWEVER shoe size can only give an estimation of height.

Difficulties include variation in the style of the sole and heel that influences the variability of the imprint left by shoes of the same size.

The other major problem is the fit or lack of fit of the shoe to the foot. How do you know if the shoes that left the imprint were tight on the wearer's feet, pinched the toes or were a loose fit?

In the Giles & Vallandigham (1991) study, height to foot ratio study the average excess of length of shoe over length of foot for the sample wearing flat-soled shoes was 2.62cm while that of the sample wearing heels was slightly greater, 2.87cm.

Some values from this study are below.

The table shows height estimates for men based on shoeprint lengths for "flats".

Shoeprint length cm	Estimated height cm	Height range cm
24	156.2	150-163
24.5	157.9	152-164
25	159.6	153-166
25.5	161.3	155-168
26	163.1	157-169
26.5	164.8	158-171
27	166.5	160-173
27.5	168.2	162-175
28	170	164-176

References

Cheng, J., Leung, S., Chiu, B., Tse, P., Lee, C., Chan, A., Xia G., Guo., Leung, A., Xu, Y. 1998 Can We Predict Body Height from Segmental Bone Length Measurements? A Study of 3,647 Children. *Journal of Pediatric Orthopaedics*. 18(3):387-393.

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