

What Is Human Ergonomics and Anthropometry?

Worksheet

Human ergonomics and anthropometry use statistical body-measurement data (like average reach, stride length, and eye height) to design spaces, furniture, and stairs that are safe, comfortable, and efficient for the human body to use.

Questions

1. Using Blondel's formula $2R + T = 63$ cm, what tread depth suits a riser of 18 cm?
 - A) 27 cm
 - B) 45 cm
 - C) 18 cm
 - D) 36 cm
2. What does anthropometry measure?
 - A) Building material strength
 - B) Human body dimensions
 - C) Site drainage patterns
 - D) Structural load paths
3. Why do architects typically design for the 5th to 95th percentile of body sizes?
 - A) It's required by law everywhere
 - B) It accommodates the vast majority of users without over-customizing for extremes
 - C) It's cheaper than measuring anyone
 - D) It only applies to children
4. In Blondel's stair formula, what does a LARGER riser height typically require?
 - A) A larger tread depth
 - B) A smaller tread depth
 - C) No change to tread depth
 - D) An additional handrail
5. A staircase is designed with a riser height of 17 cm. Using Blondel's formula ($2R + T = 63$ cm), what tread depth gives a comfortable stride?
6. An architect wants a shallow, gentle stair with a 25 cm tread. What riser height does Blondel's formula suggest?
7. A kitchen counter is designed using anthropometric data where the average standing elbow height is 105 cm. Ergonomic guidance recommends counters sit 10-15 cm below elbow height. What counter height range does this suggest?
8. Define: What is anthropometry?
9. Define: What is Blondel's stair formula?
10. Define: What is the difference between ergonomics and anthropometry?

Answer Key

1. A) $27 \text{ cm} - T = 63 - 2R = 63 - 36 = 27 \text{ cm}$.
2. B) Human body dimensions - Anthropometry is the study and measurement of human body dimensions.
3. B) It accommodates the vast majority of users without over-customizing for extremes - Designing within this percentile range comfortably fits about 90% of the population.
4. B) A smaller tread depth - Since $2R + T = 63$, increasing R decreases the tread T needed to keep stride comfortable.
5. $2R + T = 63$ $T = 63 - 2R = 63 - 2(17) = 63 - 34 = 29 \text{ cm}$
6. $2R + T = 63$ $2R = 63 - T = 63 - 25 = 38$ $R = 19 \text{ cm}$
7. Counter height = elbow height (10 to 15 cm) Low end = $105 - 15 = 90 \text{ cm}$ High end = $105 - 10 = 95 \text{ cm}$
Recommended range 90-95 cm
8. The scientific measurement of human body dimensions - height, reach, stride length, eye level - used to inform design.
9. $2R + T = 63 \text{ cm}$, where R is riser height and T is tread depth - based on the average human stride length.
10. Anthropometry measures the body; ergonomics applies those measurements to design comfortable, efficient, safe spaces and objects.

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