Draw a Skeleton with Joint and Limb Landmark Checks

Original tasks 1, 2, 3 / complete keys

Task 1

Hypothetical paper height 20 cm; skeleton height 15 cm. Divide into eight bands. Where should the knee joint sit, and what is the band height?

Answer: Band height is 15 divided by 8, or 1.875 cm. The knee sits on band 6, which is 6 times 1.875, or 11.25 cm below the top of the skeleton. Check: 11.25 cm is less than 15 cm, and measuring from the top of the drawn skeleton to the knee should give about 11.25 cm.

Reason: Eight equal bands scale the skeleton height. Counting bands 1 to 8 from the top, band 6 is the knee guide in this convention, so the knee is six band heights below the top.

Check: Multiply band height by 6 and confirm the result is less than 15 cm; then measure the drawn knee distance from the top of the skeleton and compare it to 11.25 cm.

Task 2

A drawn upper arm measures 3.2 cm. Skeleton height is 16 cm. Using eight bands and a target of 1.5 bands, does it pass the 0.5 cm check?

Answer: Band height is 16 divided by 8, or 2.0 cm. Target upper arm is 1.5 times 2.0, or 3.0 cm. The difference is 3.2 minus 3.0, or 0.2 cm, which is under 0.5 cm, so it passes.

Reason: Compute band height by dividing skeleton height by 8, multiply by 1.5 for the target upper arm, then subtract the measured length to get the difference.

Check: Re-measure the upper arm from shoulder joint to elbow joint, recompute the target as 1.5 times band height, and confirm the absolute difference is under 0.5 cm.

Task 3

In a front-view sketch, the left shoulder is 4.5 cm from the centerline and the right shoulder is 5.2 cm. The band height is 2.0 cm. Is the symmetry acceptable under a one-band-width rule?

Answer: The difference is 5.2 minus 4.5, or 0.7 cm. One band width is 2.0 cm, and 0.7 cm is less than 2.0 cm, so the symmetry is acceptable. Note the asymmetry and keep the landmark check.

Reason: Symmetry tolerance is one band width in this convention; compare the absolute difference between the two shoulder distances to the band height.

Check: Measure both shoulder distances from the centerline again, subtract the smaller from the larger, and confirm the result is under 2.0 cm.

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Original tasks 4 / complete keys

Task 4

A wrist joint is placed 1.0 cm above the hip band. The band height is 1.5 cm. Does it pass the half-band landmark check?

Answer: Half a band is 1.5 divided by 2, or 0.75 cm. The wrist is 1.0 cm from the hip band, and 1.0 cm exceeds 0.75 cm, so it fails. Move the wrist at least 0.25 cm toward the hip band and recheck.

Reason: The half-band rule limits how far a joint may sit from its guide; compare the vertical distance to half the band height.

Check: Measure the vertical distance from the wrist joint to the hip band, divide the band height by 2, and confirm the distance is no more than that half-band value.

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Source rubric / reflection

- [ ] All major joints are marked before bones are drawn.
- [ ] Joint landmarks sit within half a band of their guides.
- [ ] Limb segment lengths are within 0.5 cm of the band arithmetic check.
- [ ] X-height labels are measured baseline to midline and letter style is legible.
- [ ] Valid alternatives, such as slightly wider shoulders, are accepted if landmark checks pass.
- [ ] Measurements use one consistent unit and chosen values are labeled as examples.

Reflection: What did you check, what did you change, and what will you try next?