# Drawing Pangolin Scales: Overlap, Layer Order, and Edge Shading

Original tasks 1, 2, 3 / complete keys

Task 1

A body outline is 24 cm long from neck to tail base. You want ten scale rows evenly spaced. Calculate the spacing between row guide lines and describe where the first and last guides go.

Answer: Spacing is 24 cm divided by 10 rows, which equals 2.4 cm. Place the first guide at the neck and the last at the tail base, then mark the remaining guides at 2.4 cm intervals.

Reason: Even spacing means the total length is divided by the number of intervals, which equals the number of rows when the first and last guides are at the ends.

Check: Measure each interval with a ruler; every interval should read 2.4 cm within your measurement accuracy, and the sum of intervals should equal 24 cm.

Task 2

You draw a row of five scales. The overlap convention is front scales over rear scales. Describe the drawing order for that row and state one check that the order was followed.

Answer: Draw the rearmost scale first, then each scale toward the head so that each new scale covers the rear edge of the scale behind it. Check that every visible edge points toward the tail.

Reason: Drawing rear scales first allows the front scales to overlap them cleanly; reversing the order would leave rear edges on top and break the convention.

Check: Trace the visible edges with a finger; all should point in the same direction along the body, and no rear edge should sit above a front scale.

Task 3

A scale is drawn 3 cm wide and 2 cm tall. The next scale behind it should overlap by one third of its height. Calculate the overlap distance in centimetres and state how much of the rear scale remains visible.

Answer: One third of 2 cm is about 0.67 cm. The overlap distance is 0.67 cm, and the rear scale remains visible for about 1.33 cm of its height.

Reason: The overlap is a fraction of the rear scale height; subtracting the overlap from the full height gives the visible remainder.

Check: Measure the visible height of the rear scale with a ruler; it should read about 1.33 cm, and the hidden part should read about 0.67 cm.

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Original tasks 4 / complete keys

Task 4

You plan to shade with a light direction from the upper left. For a scale whose visible edge faces the lower right, state where the thin shadow line goes and where the lightest value goes.

Answer: The thin shadow line goes just under the visible edge on the lower right side, and the lightest value goes on the top surface facing the upper left.

Reason: The light comes from the upper left, so surfaces facing that direction are lightest, and the narrow gap under the overlapping edge is in shadow.

Check: Check that the darkest values sit in the narrow gaps under visible edges and that the top surfaces facing upper left are the lightest values.

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Source rubric / reflection

- [ ] Overlap direction is stated and kept consistent from head to tail.
- [ ] Scales are drawn as overlapping plates, not separate tiles with gaps all around.
- [ ] Scale rows follow the body contour and cross-curves.
- [ ] Scale size varies sensibly across the body while keeping the overlap readable.
- [ ] Shading uses a thin shadow under visible edges to show which plate sits above.
- [ ] The silhouette reads as a pangolin with a rounded back and tapering tail.
- [ ] Valid alternative conventions are accepted if stated and applied consistently.

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