How to Draw Snake Scales on a Curved Gourd Surface

Original tasks 1, 2, 3 / complete keys

Task 1

A gourd ring measures 240 mm circumference. Your convention uses an 8 mm scale width plus 2 mm gap. Estimate how many scales fit on that ring.

Answer: About 24 scales.

Reason: Add width and gap to get 10 mm per scale. Divide 240 by 10 to get 24.

Check: Multiply 24 by 10 mm to return to 240 mm; confirm the count is a whole number.

Task 2

Two guide rings measure 360 mm and 300 mm circumference. Your scale width plus gap is 12 mm. Estimate the difference in scales per row and state whether scale size should change.

Answer: The wider ring fits about 30 scales; the narrower ring fits about 25 scales. The difference is 5 scales, and scale size should not change.

Reason: 360 divided by 12 is 30; 300 divided by 12 is 25. The narrowing surface reduces the count, not the scale size.

Check: Multiply each count by 12 mm to recover the original circumference.

Task 3

A gourd leans so that one guide ring is tilted relative to the table. Describe how to redraw that ring and why.

Answer: Redraw the ring so it crosses the gourd's centerline at a right angle to the local surface, even if it looks tilted compared with the table.

Reason: Guide rings must follow the surface contour; using the table as a reference would make scales bunch on one side.

Check: Check that the ring's distance from the neighboring ring stays roughly constant along the surface.

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Original tasks 4 / complete keys

Task 4

Your convention uses a 12 mm scale height and one-third overlap. You want four rows between guide rings. How far apart should the guide rings be along the surface?

Answer: About 48 mm apart along the surface.

Reason: Four rows at 12 mm each gives 48 mm. Overlap affects appearance but not the row-to-row spacing along the surface in this simple convention.

Check: Measure the surface distance between rings with a flexible tape and compare it with 48 mm; adjust if your measured value differs.

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Source rubric / reflection

- [ ] Guide rings follow the gourd's local contour rather than a straight horizontal line.
- [ ] Scale size and overlap fraction match the stated convention across rows.
- [ ] Rows are staggered so no vertical seams appear.
- [ ] Scale count per row decreases where circumference decreases, without shrinking scales.
- [ ] A clear stop line or boundary is marked and explained.
- [ ] All numerical values are labeled as hypothetical examples or measured from the actual gourd.

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