Draw a Mermaid Scale Pattern: Pointed Rows and Pencil Shading

Original tasks 1, 2, 3 / complete keys

Task 1

Using a hypothetical scale width of 15 mm and height 20 mm, describe the placement of four scales in row one and three scales in row two, including the offset.

Answer: Row one centers at 7.5 mm, 22.5 mm, 37.5 mm, and 52.5 mm. Row two is offset by half a width, 7.5 mm, so centers sit at 15 mm, 30 mm, and 45 mm.

Reason: Half of 15 mm is 7.5 mm. Adding 7.5 mm to each row-one center gives the row-two centers, which places row-two scales between row-one scales.

Check: Confirm each row-two center is exactly 7.5 mm from the nearest row-one center and that spacing within each row is 15 mm.

Task 2

A scale is 24 mm tall. State the hypothetical overlap depth if rows overlap by one third of the scale height, and explain how much of the lower scale remains visible.

Answer: One third of 24 mm is 8 mm. The overlap is 8 mm, so 16 mm of the lower scale remains visible.

Reason: Divide 24 by 3 to get 8 mm overlap, then subtract 8 mm from 24 mm to find the visible portion.

Check: Verify that 8 mm plus 16 mm equals 24 mm and that the overlap is one third of the total height.

Task 3

Describe how to shade three overlapping scales when light comes from the upper left, naming where the light, medium, and dark layers go.

Answer: Apply a light layer over each scale except a thin upper-left highlight sliver. Add a medium layer along the lower right curve and near the point. Place a dark accent under the overlapping edge of the scale above.

Reason: A consistent upper-left light source means the lower right receives more shading and overlaps cast the darkest accent.

Check: Check that every scale has a highlight on the upper left and the darkest accent at the overlap, with no conflicting shading direction.

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Original tasks 4 / complete keys

Task 4

A row contains scales at 10 mm, 30 mm, and 50 mm centers. State the centers of the next row if the offset is half a scale width of 20 mm, and explain the overlap if scale height is 30 mm.

Answer: Half of 20 mm is 10 mm, so the next row centers are at 20 mm and 40 mm. One third of 30 mm is 10 mm, so the overlap is 10 mm.

Reason: Offset by half the width places new scales between old ones. Overlap by one third of height is found by dividing 30 mm by 3.

Check: Confirm each new center is 10 mm from a previous center and that 10 mm overlap plus 20 mm visible equals 30 mm height.

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Source rubric / reflection

- [ ] Scale shape: each scale has a rounded top, curved sides, and one centered downward point.
- [ ] Row offset: each row shifts by about half a scale width from the previous row.
- [ ] Overlap: rows overlap by roughly one third of the scale height, keeping points visible.
- [ ] Shading: light, medium, and dark layers follow one consistent light direction.
- [ ] Consistency: scale size and spacing remain reasonably even across the pattern.
- [ ] Presentation: construction guides are lighter than final outlines and shading.

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