Scale Wing Overlay: Drawing Overlapping Plate Segments

Original tasks 1, 2, 3, 4 / complete keys

Task 1

A drawn wing is 12 cm long at a scale of 1 cm to 8 cm imagined. What is the imagined length?

Answer: 96 cm.

Reason: Multiply the drawn length by the scale factor: 12 times 8 equals 96.

Check: Reverse the calculation: 96 divided by 8 equals 12 cm drawn.

Task 2

A root row has 5 plates and a middle row has 6 plates. Each plate overlaps by 0.5 cm on paper. What is the total overlap depth across the root row if every plate except the last overlaps once?

Answer: 2.0 cm.

Reason: Four overlaps occur in a row of five plates. Four times 0.5 cm equals 2.0 cm.

Check: Count the overlap lines in the root row and multiply by 0.5 cm.

Task 3

A wing overlay uses a 1 cm to 10 cm scale. The drawn width is 7 cm. A second drawing uses a 1 cm to 5 cm scale and a drawn width of 14 cm. Which imagined width is larger?

Answer: Both imagined widths are equal: 70 cm. Neither is larger.

Reason: First: 7 times 10 equals 70 cm. Second: 14 times 5 equals 70 cm. The values are equal.

Check: Divide each imagined width by its scale factor to recover the drawn width.

Task 4

You plan three rows with 4, 5, and 3 plates. You label every plate in the middle row and two plates in the root row. How many labeled segments are there, and how many unlabeled plates remain?

Answer: 7 labeled segments; 5 unlabeled plates remain.

Reason: Middle row labels: 5. Root row labels: 2. Total labeled equals 7. Total plates equal 4 plus 5 plus 3 equals 12. Unlabeled equals 12 minus 7 equals 5.

Check: Add labeled and unlabeled counts: 7 plus 5 equals 12, matching the total plate count.

Scale Wing Overlay: Drawing Overlapping Plate Segments

Source rubric / reflection

- [ ] Scale ratio is written and used consistently.
- [ ] Wing outline is closed and divided into three rows.
- [ ] Plates are drawn from trailing edge to leading edge with a consistent overlap direction.
- [ ] Overlap depth is marked and repeated within each row.
- [ ] Hidden outlines are light or erased; visible edges are clear.
- [ ] At least six segments are labeled and a key is present.
- [ ] Measurements are recorded in one unit system and checked by multiplication.

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