Dragon Wing Drawing: Bone Struts, Membrane Panels, and Folded vs Spread Forms

Original tasks 1, 2 / complete keys

Task 1

Draw a spread wing with three struts and two membrane panels. Label the leading-edge bone, wrist joint, and both panels. Describe where each panel sags.

Answer: A valid drawing shows a leading-edge bone from shoulder to wrist, three struts fanning from the wrist, and two panels between adjacent struts. Each panel sags shallowly toward the trailing edge. Panel 1 sits between strut 1 and strut 2; panel 2 sits between strut 2 and strut 3.

Reason: The structure requires a leading edge, a wrist joint, and struts that define panel boundaries. Sag direction follows the trailing edge, not the struts.

Check: Count struts (three) and panels (two). Confirm each panel touches two struts and the trailing membrane edge. Check that no panel crosses a strut without a joint.

Task 2

Convert the spread wing from the previous exercise into a folded wing. Keep the same three struts and two panels. Show one strut hidden behind a membrane fold using a dashed line.

Answer: A valid folded wing rotates the strut tips toward the body, overlaps panel 1 over panel 2, and shows the middle strut as a dashed line behind the fold. The leading-edge bone and wrist joint remain in the same relative position.

Reason: Folding changes strut angles and panel overlap, not the underlying count or attachment points. Dashed lines preserve structural traceability.

Check: Verify three struts total (two solid, one dashed) and two numbered panels. Confirm the dashed strut connects to the same wrist and attachment point as in the spread version.

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Original tasks 3, 4 / complete keys

Task 3

A learner shades a spread wing with strokes running from wrist to tip along the struts. Explain why this shading is inconsistent and describe a better direction.

Answer: Shading along struts makes the membrane look rigid and bone-like. A better direction is parallel to each panel's sag, which runs roughly from leading edge toward trailing edge between adjacent struts.

Reason: Membrane shading should describe surface tension and sag, not the underlying bone direction. Panel-based shading keeps the membrane readable.

Check: Compare shading strokes to panel sag lines. If strokes cross panel boundaries without following sag, revise them.

Task 4

Using a hypothetical 16 cm leading edge and 10 cm trailing span, calculate a simple area check for one rectangular membrane panel. State the units and label the values as hypothetical.

Answer: 16 cm times 10 cm equals 160 square cm. Label the result as a hypothetical example because the dimensions are chosen, not measured from actual equipment.

Reason: Area equals length times width when the panel is treated as a rectangle for a simple check. Consistent units keep the arithmetic checkable.

Check: Recompute 16 times 10 to confirm 160. Confirm both dimensions use centimeters and the result uses square centimeters.

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Source rubric / reflection

- [ ] Leading-edge bone is clearly drawn from shoulder to wrist.
- [ ] Three or four finger struts radiate from the wrist and connect to membrane attachment points.
- [ ] Membrane panels sag between struts and do not cross struts without joints.
- [ ] Spread and folded variants use the same strut count and panel numbering.
- [ ] Folded wing shows hidden struts with dashed lines and consistent fold order.
- [ ] Shading follows panel sag direction, with darker creases in folds.
- [ ] Labels sit between baseline and midline at x-height; alternative lettering styles are acceptable if readable.
- [ ] Any numerical measurements use consistent units and are labeled as hypothetical examples unless measured from actual equipment.

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