Bumblebee Drawing: Wing, Stripe, and Leg Construction

Original tasks 1, 2 / complete keys

Task 1

A bumblebee drawing has abdomen bands of widths 0.3, 0.7, 0.4, 0.5, and 0.6 units. Find the widest and narrowest bands, compute the ratio, and state whether the stripes pass the 2:1 check.

Answer: Widest band 0.7 units, narrowest 0.3 units. Ratio 0.7 ÷ 0.3 ≈ 2.33, which is greater than 2, so the stripes do not pass the check.

Reason: Divide the widest by the narrowest. Since 2.33 exceeds 2, at least one band is more than twice another, so the stripe widths are too uneven.

Check: Re-read the five widths, confirm the largest and smallest values, and recompute 0.7 ÷ 0.3. Compare the result to 2.

Task 2

A student plans a bee with head width 1 unit, thorax width 1.2 units, and abdomen width 1.8 units. The drawn abdomen is 2.5 units long and the head is 1 unit long. Check whether the abdomen is about twice the head length and whether the widths match the plan.

Answer: Abdomen length 2.5 units versus head length 1 unit gives a ratio of 2.5, which matches the target of about 2.5 times the head length. The widths 1, 1.2, and 1.8 match the plan. The proportion check passes.

Reason: The target is about 2.5 times the head length, so 2.5 units is on target. The three widths are exactly as planned, so the body proportion is consistent.

Check: Multiply head length by 2.5 and compare to abdomen length. Then compare each drawn width to the planned width.

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Original tasks 3, 4 / complete keys

Task 3

A drawing shows two wings attached at the abdomen and four legs attached to the thorax. Identify the construction errors and state the corrections.

Answer: The wings are attached at the abdomen instead of the thorax, and only four legs are drawn instead of six. Corrections: move both wing bases to the upper thorax, and add two more legs so there are three per side, none crossing.

Reason: The convention requires two wings at the thorax and six legs attached to the body. Attaching wings to the abdomen breaks the wing rule, and four legs breaks the leg count.

Check: Count wing attachment points and leg count. Confirm wings are on the thorax and legs number six without crossings.

Task 4

A practice bee has body ovals that overlap, five alternating bands with widths 0.5, 0.5, 0.6, 0.5, and 0.5 units, two wings at the thorax, and six legs with one pair crossing. List which rubric items pass and which fail, then give one fix.

Answer: Passes: overlapping ovals, alternating bands, band ratio $0.6 \div 0.5 = 1.2$ (within 2:1), two wings at the thorax. Fails: six legs without crossing, because one pair crosses. Fix: re-angle the crossing legs outward so they no longer overlap.

Reason: The band ratio is 1.2, which is acceptable. The only failed item is leg crossing. Re-angling the legs corrects the construction without changing the body or wings.

Check: Check each rubric item in order: ovals, bands, ratio, wings, legs. For the legs, trace each line to confirm no two cross.

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Source rubric / reflection

- [ ] Body shows three overlapping ovals: head, thorax, abdomen.
- [ ] Abdomen tapers toward the rear and is longer than the head.
- [ ] Stripes alternate and band widths stay within a 2:1 ratio.
- [ ] Two wings attach at the thorax and do not cover the head or abdomen.
- [ ] Six legs attach to the body and do not cross.
- [ ] Final lines are clear and construction lines are erased or light.
- [ ] Practice panel contains an independent bumblebee using the same construction order.

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