Draw a Cotton Gin: Labeled Mechanical Drawing Guide

Original tasks 1, 2 / complete keys

Task 1

On a 15 cm by 10 cm area, draw a frame 6 cm wide and 4 cm tall. Add a hopper 3 cm wide above it and a saw cylinder 1.5 cm across inside. Label frame, hopper, and saw cylinder. Record the hopper-to-frame width ratio.

Answer: Frame 6 cm by 4 cm, hopper 3 cm wide, saw circle 1.5 cm across inside the frame, three labels with anchor dots. Ratio 3:6 = 1:2.

Reason: The hopper is half the frame width, so the ratio simplifies to 1:2. The saw diameter is one quarter of the frame width, which fits inside.

Check: Measure the hopper and frame widths with a ruler; divide both by the smaller number to confirm 1:2. Count three anchor dots and three labels.

Task 2

Draw a gin stand 5 cm wide and 4 cm tall. Place a brush cylinder 2 cm across behind it using a dashed circle. Add a seed chute 1 cm wide below the stand. Label stand, brush cylinder, and seed chute. Record the brush-to-stand width ratio.

Answer: Stand 5 cm by 4 cm, dashed brush circle 2 cm across behind it, seed chute 1 cm wide below, three labels. Ratio 2:5.

Reason: The brush diameter is 2 cm and the stand width is 5 cm, so the ratio is 2:5. The dashed line shows the brush is hidden behind the stand.

Check: Measure the stand width and brush diameter; confirm 2:5 by dividing both by 1 cm. Check that the brush circle is dashed and has one label.

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Original tasks 3, 4 / complete keys

Task 3

Draw an air duct as a curved band 1 cm wide leading from the top of a 4 cm wide stand to the right edge of a 12 cm wide drawing area. Add a drive pulley 1 cm across at the lower left and a belt as a straight line to the stand. Label air duct, drive pulley, and belt. Record the duct width to stand width ratio.

Answer: Curved duct 1 cm wide from stand top to right edge, pulley 1 cm across at lower left, straight belt line to stand, three labels. Ratio 1:4.

Reason: The duct width is 1 cm and the stand width is 4 cm, so the ratio is 1:4. The belt connects the pulley to the stand as a visible line.

Check: Measure duct width and stand width; confirm 1:4. Check that the belt line touches the pulley and the stand, and that each label has an anchor dot.

Task 4

Draw a complete cotton gin in a 20 cm by 15 cm area with a 1 cm border. Include frame, hopper, stand, saw cylinder, brush cylinder, mote board, seed chute, air duct, drive pulley, and belt. Label all ten parts. Record two ratios: hopper-to-frame width and brush-to-saw diameter.

Answer: A centered drawing with all ten parts, ten labels with anchor dots, consistent solid and dashed lines, and two recorded ratios such as 1:2 and 3:2. Any valid scale and letter style are accepted if the convention is stated.

Reason: The complete drawing requires all parts from the guide. Ratios depend on chosen sizes; for example, a 4 cm hopper on an 8 cm frame gives 1:2, and a 3 cm brush with a 2 cm saw gives 3:2.

Check: Count ten labels and ten anchor dots. Measure the two pairs and simplify the ratios. Confirm the border is 1 cm from the paper edge and that no leader lines cross.

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Source rubric / reflection

- [ ] All required parts are present: frame, feed hopper, gin stand, saw cylinder, brush cylinder, mote board, seed chute, air duct, drive pulley, belt.
- [ ] Every label has one anchor dot and a leader line that does not cross another leader line.
- [ ] Line convention is consistent: solid for visible edges, dashed for hidden parts.
- [ ] Label text uses one cap height from baseline to the top of the uppercase letters and one simple letter style.
- [ ] At least two measured ratios are recorded and match the drawing.
- [ ] Valid alternatives are accepted if the convention is stated and followed.

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