Simple Machines Drawings Worksheets: Label Six Machines

Original tasks 1, 2 / complete keys

Task 1

Draw a pulley in side view with a grooved wheel, an axle, a rope over the wheel, and a load hanging from one end. Label wheel, axle, rope, and load. Use solid outlines and place labels outside the drawing.

Answer: The drawing shows a circle for the wheel with a center point for the axle, a rope passing over the top of the wheel, and a load box hanging from one rope end. Labels outside the drawing use straight leader lines: 'wheel' to the rim, 'axle' to the center point, 'rope' to the rope line, and 'load' to the box.

Reason: The pulley has a wheel that turns on an axle, and the rope passes over the wheel to lift or pull a load. Labeling the center point as the axle and the rim as the wheel prevents the common mistake of swapping those labels.

Check: Confirm the axle label touches the center point, the wheel label touches the rim, and the rope label touches the rope line. Check that all labels are outside the drawing and connected by straight leader lines.

Task 2

Draw an inclined plane as a right triangle with a slope, a vertical height of 6 cm, and a horizontal base of 8 cm in a hypothetical example. Label slope, height, and base. Compute the slope length and state whether the drawn slope matches.

Answer: The drawing shows a right triangle with a vertical side labeled height, a horizontal side labeled base, and a slanted side labeled slope. Using the hypothetical values, slope length is the square root of 6 squared plus 8 squared, which is the square root of 100, equal to 10 cm. The drawn slope should measure 10 cm if the drawing is to scale.

Reason: The inclined plane is a ramp. Height and base are the two shorter sides of a right triangle, and the slope is the hypotenuse. Using one unit for both measurements allows a simple arithmetic check.

Check: Measure height and base in centimeters, compute the square root of height squared plus base squared, and compare with the measured slope length. Confirm all three labels touch the correct sides.

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Original tasks 3, 4 / complete keys

Task 3

Draw a wedge as a triangular block with two sloping faces meeting at a sharp edge and a thickness at the back. Label sloping faces, sharp edge, and thickness. Use dashed lines only if a hidden edge is shown.

Answer: The drawing shows a triangle with two slanted sides meeting at a point labeled sharp edge, and a vertical back side labeled thickness. The two slanted sides are labeled sloping faces. Solid outlines are used for visible edges; no dashed lines are needed unless a hidden back edge is drawn.

Reason: A wedge converts a pushing force into a splitting force along its sloping faces. The sharp edge is the point of contact, and thickness is the distance from the sharp edge to the back.

Check: Confirm the sharp edge label touches the point where the two sloping faces meet, the thickness label touches the back side, and the sloping faces labels touch the slanted sides. Check that no label covers the drawing.

Task 4

Draw a gear as a wheel with evenly spaced teeth around its rim and an axle at the center. Label teeth, wheel body, and axle. Count the teeth and state the count. Use a hypothetical count of 12 teeth if needed.

Answer: The drawing shows a circle for the wheel body with short radial lines or small rectangles around the rim for teeth, and a center point for the axle. Labels outside the drawing use straight leader lines: 'teeth' to the rim projections, 'wheel body' to the circle, and 'axle' to the center point. The hypothetical count is 12 teeth.

Reason: A gear is a toothed wheel that meshes with another gear or chain. The teeth are on the rim, the wheel body is the main disc, and the axle is the center of rotation. Counting teeth confirms the drawing matches the label.

Check: Count the teeth around the rim and confirm the count matches the stated number. Confirm the axle label touches the center point and the wheel body label touches the circle, not the teeth.

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Source rubric / reflection

- [ ] Outline clarity: solid visible edges and dashed hidden or axis lines are used consistently.
- [ ] Part labels: every required part is labeled with the correct name.
- [ ] Leader lines: straight lines touch the labeled part and labels sit outside the drawing.
- [ ] Measurement consistency: all lengths use one unit and simple arithmetic checks match the drawing.
- [ ] Valid alternatives: letter style and view may vary if labels remain legible and parts are clear.

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