

Max's Mechanical Masterpieces: Levers and Pulleys

Learning objective: To understand how levers and pulleys function as simple machines to move heavy objects with less effort.

Follow the drawing prompts to design a contraption for Max the monkey. Use your labels from the word bank to explain how your mechanism works.

Draw: Draw a large, clear diagram showing Max the monkey using a simple machine. Your drawing should be in a technical, labelled style. Include two separate sub-drawings: 1) A lever system using a sturdy branch as a beam to lift a crate of bananas, and 2) A pulley system attached to a high branch. Use arrows to indicate the direction of the 'Effort' force and the movement of the 'Load'. Ensure the pivot points and wheel axles are clearly visible.



Label words: Fulcrum · Load · Effort · Pivot · Pulley Wheel · Axle · Tension · Mechanical Advantage

Steps:

1. Label your drawing to show where the 'Fulcrum' and the 'Load' are positioned on your lever system. Explain why the position of the fulcrum affects how heavy the load feels.
2. If Max uses a pulley system, explain why adding a second pulley wheel might make it easier to lift the crate. Justify your answer using the concept of tension.
3. Compare and contrast a lever and a pulley. Which one would you choose to lift a heavy object vertically?

Why?

4. What might happen if the axle in your pulley system was too thick or had too much friction? Explain the effect on the effort required.
5. Design a modification for your pulley system that would allow Max to pull downwards to lift the crate upwards. Draw the direction of the force.
6. Creative Extension: Imagine Max is building a crane. Write a short paragraph explaining how he could combine a lever and a pulley to lift the heaviest load possible.