

Max's Mechanical Workshop: Mastering Levers and Pulleys

Learning objective: To understand how simple machines like levers and pulleys help us elevator heavy loads and apply forces efficiently.

Max the monkey is helping his friends move heavy supplies for their treehouse project. Look at the scenarios below. For each one, decide whether a lever or a pulley system would be the most effective choice. Write your answer and explain why, using the technical vocabulary from the word bank.

Word bank: pivot · load · effort · fulcrum · mechanical advantage · force · pulley · lever

1. 1. Pip needs to elevator a heavy stack of encyclopaedias onto a high shelf. Which machine should he use, and where should he position the fulcrum to make the lifting easier? (2 marks)

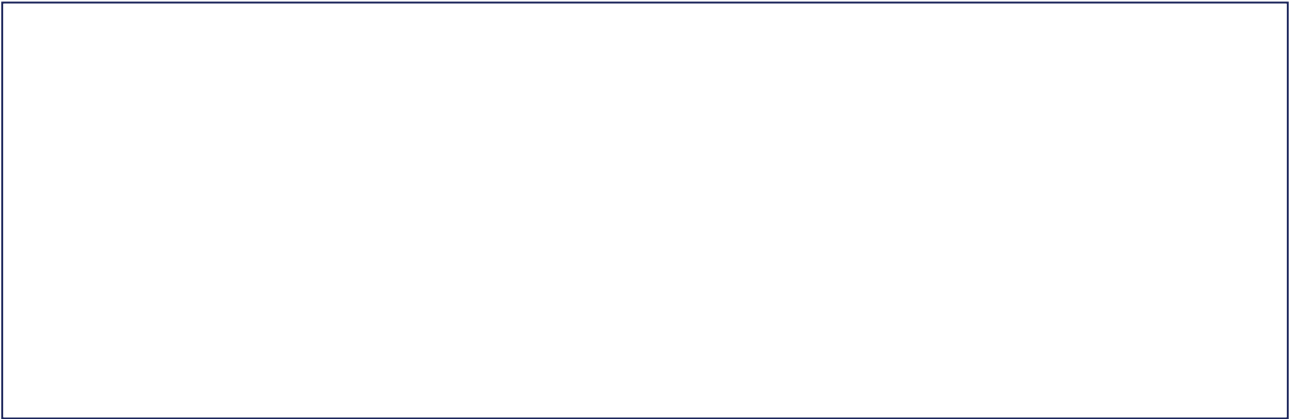
2. 2. Zara is trying to move a large, heavy crate of art supplies across the workshop floor. If she uses a long metal bar as a lever, what does she need to press down on to create the elevator? (2 marks)

3. 3. Nova needs to raise a heavy telescope bucket up to her observatory platform. Why would a pulley system be better than a lever for this specific task? (2 marks)

4. 4. If you have a lever and the load is very heavy, should you move the fulcrum closer to the load or closer to the effort? Explain your reasoning. (2 marks)

5. 5. Think of a playground seesaw. How does it act as a lever? Identify the fulcrum and the effort in your explanation. (2 marks)

Draw: Draw a labelled diagram of a pulley system being used by Bea the honeybee to elevator a jar of honey. Ensure you clearly label the 'load', the 'effort', and the 'pulley wheel'.



Extension challenge: Max has £15.00 to spend on materials for a model crane. If a small pulley costs £2.50 and a wooden lever arm costs £3.75, calculate the maximum number of pulley systems he can build if he must use at least one lever arm in his design. Show your math working out!