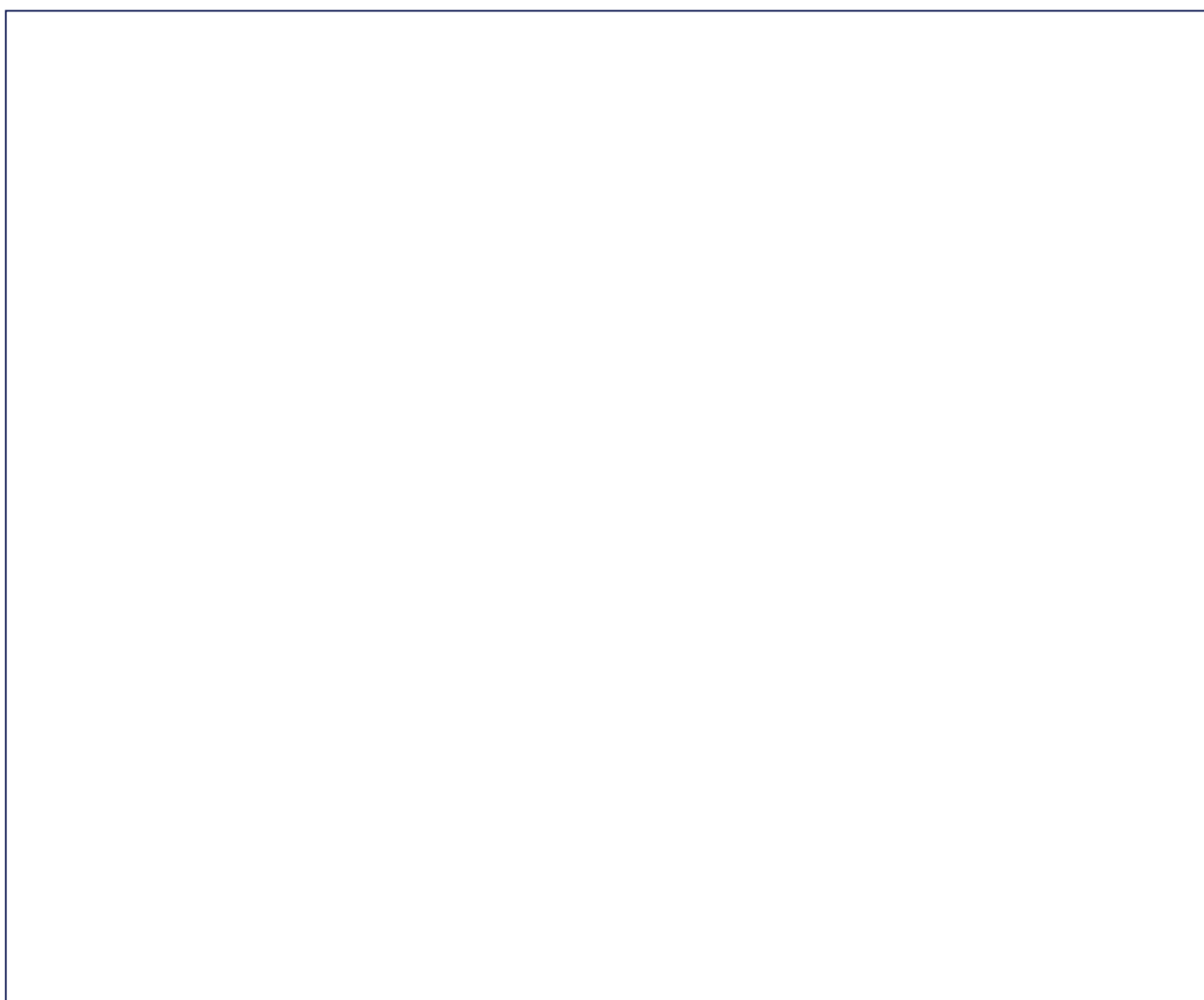


Max's Structural Engineering Challenge

Learning objective: To understand how to strengthen structures using shapes, struts, and bracing to support a load.

Max the monkey has been tasked with building a bridge to cross the jungle stream. Help him design a sturdy structure by sketching your ideas and labelling the key components that keep the bridge from collapsing under pressure.

Draw: Draw a side-view sketch of a bridge spanning a river. Use a sharp pencil to show the internal structure, including triangular trusses and diagonal bracing. Add a 'load' (like a basket of fruit) on top of the bridge to show where the weight is distributed. Use clean, technical lines and include a small zoomed-in bubble showing a cross-section of a joint where two beams meet.



Label words: Strut · Truss · Tension · Compression · Bracing · Foundation · Load-bearing · Triangle

Steps:

1. Label your drawing to show which parts of your bridge are under tension and which are under compression. Explain why you chose these materials.
2. Identify one 'weak point' in your design. What might happen if a heavy load was placed directly onto this spot?

3. Why are triangles often used in bridge construction rather than squares or rectangles? Justify your answer using the concept of rigidity.
4. Compare and contrast a suspension bridge with a beam bridge. Which would be more effective for a wide, deep gorge and why?
5. If Max wanted to make his bridge more sustainable, what natural materials might he use instead of metal or plastic? Explain your reasoning.
6. Creative Extension: Imagine a storm hits the jungle. List two specific design modifications you could add to your bridge to make it more wind-resistant.