

Max's Magnificent Structures Challenge

Learning objective: To understand the properties of materials and how to strengthen structures for stability and durability.

Help Max the monkey solve these structural puzzles! Read each question carefully and choose the best answer to build the strongest designs.

Answer Key: 1) C*, 2) True, 3) B*, 4) False, 5) Triangulation, 6) A*, 7) Tension, 8) True, 9) Foundation, 10) C*. Max hopes these answers help you build the best structures ever!

Word bank: Reinforce · Compression · Tension · Stability · Triangulation · Rigid · Foundation · Bracing

1. 1. Max is building a tower. Which shape is the strongest for providing stability? A) Square, B) Circle, C) Triangle*, D) Pentagon (1 mark)

2. 2. True or False: Adding diagonal 'bracing' to a square frame helps stop it from collapsing. (1 mark)

3. 3. Which material is most suitable for a structure that needs to be lightweight but very stiff? A) Soft clay, B) Corrugated cardboard*, C) Loose sand, D) Wet tissue (1 mark)

4. 4. True or False: A structure with a wide base is less stable than a structure with a narrow base. (1 mark)

5. 5. What is the name of the technique where triangles are used to make structures stronger? (One word answer) (1 mark)

6. 6. If Max wants to build a bridge, what does the structure need to resist? A) Gravity and weight*, B) Only wind, C) Only sunlight, D) Only bright colors (1 mark)

7. 7. When you pull on a rope, what type of force is being applied? (One word answer) (1 mark)

8. 8. True or False: A 'foundation' is the solid base upon which a building is constructed to keep it steady. (1 mark)

9. 9. What is the bottom part of a building called that keeps it from sinking into the ground? (One word answer) (1 mark)

10. 10. Max finds a box of materials. Which would make the best pillar for a bridge? A) A apartment sheet of paper, B) A folded piece of card, C) A rolled-up tube of card*, D) A pile of leaves (1 mark)

Draw: Draw a bridge design for Max the monkey. Use triangles in your design to show how you would make it strong enough to hold a basket of bananas!



Extension challenge: Imagine Max has a budget of £10. If a triangle support costs £2 and a long beam costs £3, design a structure that uses exactly £10 of materials. Write a list of what you would buy and draw your design.