

Year 4 Design Technology: Building Strong Structures

Learning objective: To identify, test, and explain how to make structures stronger and more stable.

Read each question carefully. Use the word bank to help you with your spelling. Write your answers clearly in the spaces provided.

Max the monkey is building a tall tower for his fruit collection. He needs to make sure his tower does not wobble or fall over when he puts a heavy banana on the top. He is thinking about which shapes make the best structures.

Word bank: stable · strong · triangle · base · shell · frame · rigid · joint

1. Max wants his tower to be stable. What should he build at the bottom of his tower to make it steady? (Hint: Think about the size of the bottom) (2 marks)

2. Which 2D shape is the strongest to use in a frame structure because it does not change its shape easily? (1 mark)

3. If Max uses cardboard boxes to build his tower, is he using a shell structure or a frame structure? (2 marks)

4. Look at these two structures. A tall, thin tower and a wide, short tower. Which one is more likely to fall over? Why? (4 marks)

5. Max has £5.00 to spend on materials. He buys tape for £1.50 and sticks for £2.00. How much money does he have left? If he wants to make his joints stronger, why should he use extra tape? (6 marks)

6. Explain two ways you could make a paper bridge stronger so it can hold a toy car. Use your own ideas. (5 marks)

Draw: In the box below, draw a simple frame structure that uses triangles to stay strong. Label one of the 'joints' where you would use tape or glue.



Extension challenge: Design a new structure for Max to store his fruit. Write 3 sentences about why it will be strong and stable. Total: /25