

Max's Market Probability Challenge

Learning objective: To understand and use the vocabulary of probability and calculate the likelihood of events occurring.

Read the passage below about Max the monkey's trip to the market. Use your understanding of probability to answer the questions. Ensure you justify your reasoning where asked.

Max the monkey is visiting the local market to buy fruit for his friends. He approaches a stall with a large, opaque bag filled with 20 pieces of fruit. Inside the bag, there are 10 shiny red apples, 5 golden pears, 3 spotted bananas, and 2 prickly pineapples. Max closes his eyes and selects one piece of fruit at random. Max loves to think of these situations as mathematical puzzles. He knows that the total number of outcomes is 20, and he can use fractions to describe the probability of picking each type of fruit.

Word bank: Certain · Likely · Unlikely · Impossible · Even chance · Fraction · Outcome · Probability

1. Using the information about the bag of fruit, what is the probability of Max picking a red apple? Give your answer as a fraction in its simplest form. (2 marks)

2. Explain why it is impossible for Max to pick a bunch of grapes from the bag. What would need to change in the bag to make picking grapes an 'unlikely' event? (3 marks)

3. Compare the probability of picking a golden pear to the probability of picking a prickly pineapple. Which is more likely and by how much? (3 marks)

4. Max adds 5 more spotted bananas to the bag. Justify how this changes the probability of picking a banana. Is it now more or less likely than picking an apple? (3 marks)

5. If Max wants an 'even chance' of picking a specific fruit, how many pieces of that fruit would need to be in the bag of 20? Explain your mathematical reasoning. (3 marks)

Draw: Draw a probability tree diagram or a bar chart showing the initial contents of Max's bag (10 apples, 5 pears, 3 bananas, 2 pineapples) to represent the likelihood of each fruit being selected.



Extension challenge: Imagine Max has a second bag. If he wants the probability of picking a pear to be $\frac{1}{4}$, and he knows there are 12 items in that second bag, how many pears must be inside? Create a word problem for a partner that involves a scenario where the probability is 'certain'.