

Max's Probability Investigation: Predicting the Future

Learning objective: To identify and use the language of probability to describe the likelihood of events occurring, and to represent these as fractions, decimals, or percentages.

Max the monkey is organising his fruit shop. Help him calculate the chances of picking specific items from his basket. Use the word bank to describe the likelihood of each event and show your working out using fractions or decimals where possible.

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

1. Max has 5 apples, 3 bananas, and 2 pears in a bag. If you pick one piece of fruit at random, describe the probability of picking an apple using mathematical language and a fraction. (2 marks)

2. What is the probability of picking a grape from Max's basket? Explain why you chose this specific word from the word bank to describe the likelihood. (2 marks)

3. Compare the probability of picking a banana to the probability of picking a pear. Justify your answer using the data provided. (3 marks)

4. If Max adds 5 oranges to the bag, explain how this changes the probability of picking an apple. What might happen if he adds even more fruit? (3 marks)

5. Design your own scenario: Create a bag containing 20 items of different colours. State the probability of picking one specific colour as a fraction, a decimal, and a percentage. (4 marks)

6. Max claims that because there are three types of fruit (apples, bananas, pears), there is an 'even chance' of picking any of them. Is Max correct? Justify your reasoning. (3 marks)

Extension challenge: Challenge: If you were to repeat the experiment of picking a fruit 100 times (always replacing the fruit after each pick), do you think you would pick the exact number of fruits predicted by your probability fraction? Explain why or why not, considering the difference between theoretical probability and experimental results.