

Max's Mathematical Prime Investigation

Learning objective: To identify, describe and represent prime numbers up to 100 and recall prime numbers up to 19.

Read the explanation below carefully. Use your knowledge of factors and multiples to solve Max the Monkey's puzzles. Show your working out clearly for each calculation.

Max the Monkey is sorting his collection of jungle tokens. He has discovered that some numbers are 'lonely'—they can only be divided by 1 and themselves. These are called prime numbers. For example, 7 is a prime number because its only factors are 1 and 7. However, 8 is a composite number because it has more than two factors (1, 2, 4, and 8). Max reminds us that the number 1 is neither prime nor composite, as it only has one factor. A prime number must have exactly two distinct factors.

Word bank: prime number · composite number · factor · multiple · divisible · product · remainder

1. Max has 15 tokens. Is 15 a prime number? Justify your answer by listing all of its factors. (2 marks)

2. Identify all the prime numbers between 20 and 40. Explain how you know they are prime. (3 marks)

3. If Max buys a bag of treats costing £13, and 13 is a prime number, can he share them equally between 2, 3, or 4 friends without having any left over? Explain why. (2 marks)

4. Compare and contrast the number 2 and the number 9. Why is 2 considered a unique prime number? (2 marks)

5. What might happen if all numbers were prime? Discuss the impact this would have on multiplication and division. (2 marks)

Draw: Draw a 'Prime Path' through the jungle. Create a series of stepping stones numbered 1 to 20. Colour the stones that represent prime numbers in bright yellow and the composite numbers in forest green.



Extension challenge: Investigate 'twin primes' (pairs of prime numbers that have a difference of 2, such as 3 and 5). Research and list three more pairs of twin primes. Can you find a pair of twin primes that are both greater than 50? Justify your findings.