

Max's Mountain Expedition: Navigating Sub-Zero Temperatures

Learning objective: To calculate intervals across zero and solve problems involving negative numbers in a real-world context.

Max the monkey is climbing the Frosty Peaks to study how temperature changes at different altitudes. Use the vertical number line provided in your head (or draw one) to help Max calculate the temperature differences. For each question, show your working out to justify how you arrived at the final degree reading.

Word bank: interval · altitude · degrees Celsius · sub-zero · difference · decrease · increase

1. At the base camp, the temperature is 4°C . As Max climbs higher, the temperature drops by 7 degrees. What is the new temperature? Explain your calculation. (2 marks)

2. At the summit, the thermometer reads -5°C . By midday, the sun warms the peak, causing the temperature to rise by 6 degrees. What is the temperature at midday? (2 marks)

3. Max finds a cave where the temperature is -2°C . Outside the cave, the temperature is -8°C . What is the difference in degrees between the cave and the outside air? (2 marks)

4. Compare and contrast: Why is a temperature of -9°C considered 'colder' than -3°C , even though 9 is a larger digit than 3? (3 marks)

5. If the temperature decreases by 3 degrees every hour, and it is currently 1°C , what will the temperature be in 4 hours? Justify your answer. (3 marks)

6. What might happen if the temperature at the summit dropped another 10 degrees from its current reading of -5°C ? Show the final value. (2 marks)

Draw: Draw a vertical thermometer showing the range from -10°C to 10°C . Mark the freezing point (0°C) and label where Max's different recording spots (-5°C , -2°C , and 4°C) would sit on the scale.



Extension challenge: Design a 'Temperature Log' table for Max. Create a sequence of five temperatures that show a fluctuating pattern of rising and falling, ensuring that at least three of your readings are negative numbers. Challenge a partner to find the total difference between your highest and lowest recorded temperatures.