

Max's Mountain Expedition: Navigating Negative Numbers

Learning objective: To understand, order, and calculate with negative numbers in context, including crossing zero.

Read about Max's climb up the frosty peaks of the Frost-Peak Range. Use your knowledge of number lines and temperature scales to answer the questions below. Show your working out clearly.

Max the monkey is an expert mountaineer who loves using maths to plan his expeditions. Today, he is exploring the Frost-Peak Range. At the base camp, the temperature is a mild 4°C . As Max ascends the mountain, the temperature drops by 2°C for every 100 metres he climbs. By the time he reaches the first ridge, he has climbed 300 metres. As the sun sets, the temperature plummets further, dropping another 6°C overnight. Max keeps a careful log of these changes in his notebook, noting down both positive and negative values to track the freezing conditions.

Word bank: ascending · descending · interval · negative · positive · below zero · difference · calculate

1. Calculate the temperature at the first ridge before the sun sets. Explain the method you used to find this value. (2 marks)

2. What is the temperature at the summit after the temperature drops by 6°C overnight? Draw a number line to justify your answer. (2 marks)

3. If the temperature at the very peak is -5°C and the temperature at the base camp is 4°C , what is the total difference in temperature between these two points? (2 marks)

4. Compare and contrast the effect of climbing higher on the mountain versus the effect of the sun setting on the temperature. Which factor caused a greater change? (3 marks)

5. Justify why it is important for a mountaineer to understand negative numbers when planning for extreme weather conditions. (2 marks)

Draw: Draw a vertical thermometer showing the temperatures Max experienced. Mark the base camp at 4°C, the first ridge, and the final overnight temperature, using a blue colour for below zero.



Extension challenge: Imagine Max starts his journey at a different peak where the temperature is -8°C. He climbs until the temperature is -1°C. How many degrees did the temperature increase? Write a creative diary entry from Max's perspective describing the sensation of the air becoming 'warmer' as he descends, using at least three words from the word bank.