

# Year 5 Mathematics Assessment: Exploring Negative Numbers

*Learning objective: To interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, and calculate intervals across zero.*

Read each question carefully. Max the monkey has provided some challenges to test your mathematical reasoning. Show your working out clearly to gain full marks.

Max the monkey is helping his friends navigate the changing weather and terrain of the Great Mountain. Sometimes, the temperature drops below zero, and sometimes the explorers must climb deep into underground tunnels. Max uses negative numbers to track their progress.

*Word bank: integer · negative · positive · interval · temperature · descend · ascend · zero · difference*

**1. The temperature on the mountain peak is  $4^{\circ}\text{C}$ . By midnight, it drops by  $7^{\circ}\text{C}$ . What is the new temperature? (1 mark)**

**2. Order these temperatures from coldest to warmest:  $-3^{\circ}\text{C}$ ,  $5^{\circ}\text{C}$ ,  $0^{\circ}\text{C}$ ,  $-8^{\circ}\text{C}$ ,  $2^{\circ}\text{C}$ . (2 marks)**

**3. If a diver starts at sea level (0 metres) and descends 12 metres into a submarine cave, then ascends 5 metres, what is their final position relative to sea level? (2 marks)**

**4. Max has  $\pounds 5$  in his bank account. He buys a gift for his friend costing  $\pounds 8$ . Explain how his bank balance changes and what the final balance is using a negative number. (3 marks)**

**5. Compare and contrast the value of  $-10$  and  $-2$ . Justify your answer by explaining which number is greater and why. (4 marks)**

**6. What is the difference in temperature between  $-6^{\circ}\text{C}$  and  $9^{\circ}\text{C}$ ? Show your calculation method. (3 marks)**

**7. What might happen if a thermometer was broken and could not display negative numbers? How would an explorer know if the water was freezing? (5 marks)**

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**8. Create a word problem where a negative number is required to find the solution. Write the problem and the solution clearly. (5 marks)**

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**Draw:** Draw a vertical number line representing a deep-sea trench and a mountain peak. Label 0 as sea level, and show three points: +10 metres (a bird), 0 metres (a boat), and -10 metres (a fish).



*Extension challenge: Total: /25. Challenge: If the temperature falls by 2 degrees every hour starting from 3°C, how many hours will it take to reach -9°C? Explain your reasoning.*