

## Mastery

A scientist measures the depth of some objects below the surface of the sea. She records her measurements using negative numbers.

Object	Depth
Coral reef	-2 m
Shipwreck	-11 m
Pirate treasure	four times as deep as the coral reef
Sleeping shark	3 metres above the shipwreck

Which object is deepest? Explain your choice.

Is the sleeping shark deeper than the pirate treasure? Explain your reasoning.

A seagull is hovering 1 m above the surface of the sea. How far apart are the seagull and the coral reef?

Can you draw a picture to show this?

## Mastery with Greater Depth

A scientist measured the temperature each day for one week at 06:00.

On Sunday the temperature was  $1.6^{\circ}\text{C}$ .

On Monday the temperature had fallen by  $3^{\circ}\text{C}$ .

On Tuesday the temperature had fallen by  $2.1^{\circ}\text{C}$ .

On Wednesday the temperature had risen by  $1.6^{\circ}\text{C}$ .

On Thursday the temperature had risen by  $4.2^{\circ}\text{C}$ .

On Friday the temperature had fallen by  $0.9^{\circ}\text{C}$ .

On Saturday the temperature had risen by  $0.2^{\circ}\text{C}$ .

What was the temperature on Saturday?

### Answers

The Shipwreck is the deepest because -11 is the furthest away from 0.

The sleeping shark and the pirate treasure are both at a depth of -8m because four times the depth of the coral reef  $4 \times -2\text{m} = -8\text{m}$  and 3 metres above the shipwreck  $-11 + 3 = -8\text{m}$

3m apart

### Answers

$1.6^{\circ}\text{C}$

(Overall in the week, the temperature fell by  $6^{\circ}\text{C}$  and rose by  $6^{\circ}\text{C}$  so it stayed the same at  $1.6^{\circ}\text{C}$ )

## Fluency

- Fill in the missing numbers.

152, 102, 52, 2, \_\_, \_\_

-6, -4, \_\_, \_\_, 2, 4

\_\_, -1, 5, 11, \_\_

### Answers

-48, -98

-2, 0

-7, 17

- Filip had £17.50 in bank account. He paid for a jumper that was £30. How much did he have in his bank account after?

Answer -£12.50

- In a Science experiment, a class videoed a thermometer overnight. At 02:30 it read  $-12^{\circ}\text{C}$  and it was  $15^{\circ}\text{C}$  at 13:00. What was the difference in temperatures?

Answer  $27^{\circ}\text{C}$

## Reasoning

- Spot the mistake:**  
-75, -15, 35, 105  
What is wrong with this sequence of numbers?

Answer The sequence increases by different amounts. First 60 then 50 then 70.

- True or false?**  
When I count backwards in 50s from 10 I will say -150.  
Explain how you know.

Answer False. If the person started at 0, they would reach -150. However, when starting at 10 they would say -140 (10, -40, -90, -140).

- A company decided to build offices underground as well as over ground. The manager says

If we build from 100 down to -100 then we will have 200 floors

Is he right? Convince me.

### Answer

He is not right. There are 201 floors because  $100 - (-100) = 200$  but there's 0 floor as well to count.

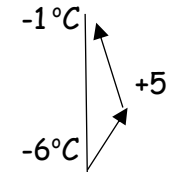
## Problem Solving

- True or false?**  
The temperature is  $-6^{\circ}\text{C}$ . It becomes 5 degrees warmer. It is now  $-11^{\circ}\text{C}$ .  
Explain your answer using a drawing.

### Answer

False - it's now  $-1^{\circ}\text{C}$

$$(-6 - 5 = -11)$$



- Use  $<$ ,  $>$  or  $=$  to complete the statements

$$-5 \quad \bigcirc \quad 5$$

$$-4 \quad \bigcirc \quad -20$$

### Answer

$$-5 < 5$$

$$-4 > -20$$