

# CHAPTER 4

## Integers

### Negative Numbers in Context

The set of Positive and Negative Whole numbers, along with Zero are called the set of Integers.

**Examples of Integers** :- -8, -25, 17, 76, 0, -14, 4003, -3067.

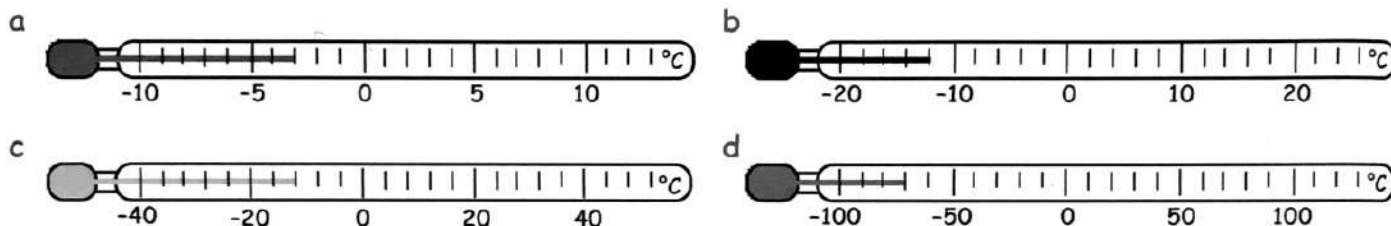
\* Note  $2.5$ ,  $\frac{1}{3}$ ,  $-5\frac{1}{4}$ ,  $-3.25$ ,  $-213.8$  etc. are not integers

Working with  
positive & negative  
numbers and zero  
in the real world



### Exercise 1 Mainly Revision

1. What temperatures are shown on these thermometers?



2. Banks deal with positive and negative values of money. (Discuss "in the red" and "in the black").

If Gerry has £100 in his bank account, the bank computer will show this as **£100.00**

Mary has overdrawn by £50. The computer will show this as **- £50.00**

a Sammi's account shows **£375.00**. What does this balance mean?

b George's account shows **- £400.00**. What does this balance mean?

c Henry had **£45.00** in his account, but withdrew £12.00.

What will his balance now show on the bank computer?

d Brenda's balance last week was **-£20**, but she paid in £15.

What's her new balance and how much more will she need to pay in to clear her overdraft?

e Len's bank balance showed **£70**.

He bought a lawnmower for £100 and a rake for £20, using his debit card.

How will his new balance show up on the bank computer?



3. Negative numbers can be used in the context of time.

The London Olympics were held in the year 2012 A.D. (anno domini).

This means 2012 years since the birth of Christ. (or +2012).

If a man was born in the year 65 B.C. (before Christ), we say he was born in the year (- 65).


a Use "+" or "-" signs to describe the following dates :-

- (i) 1966 A.D.      (ii) 312 A.D.      (iii) 21 B.C.      (iv) 729 B.C.



3. b Bugatis Lavius was born in 100 B.C. and died in 44 B.C.  
How old was Bugatis when he died ?
- c Augustus Caesar was born in 63 B.C. and died in 19 A.D.  
What age was Augustus when he died ?



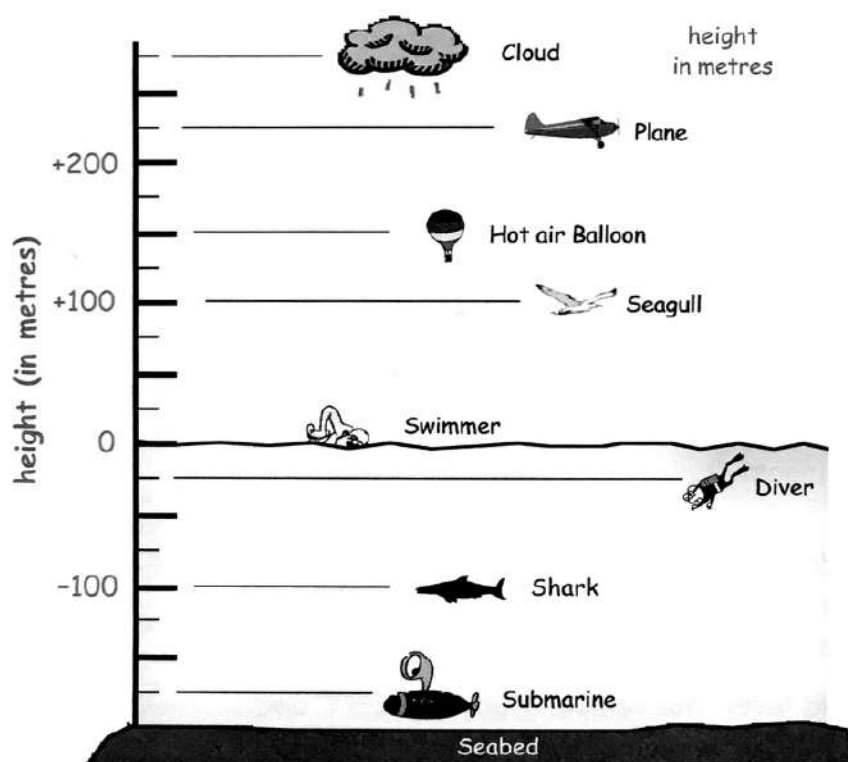
- d  Minimus was born in 42 B.C. and lived to the age of 77.  
In which year did Minimus die ?

- e Maximus died aged 63 in 54 A.D.  
In which year was Maximus born ?



4. Positive and negative numbers are used to describe heights above or below sea-level.  
Heights above sea level are *positive* (+).  
Heights below sea level are *negative* (-).

- a Use "+" or "-" to describe the heights (depths) of the following :-



- (i) the seagull
- (ii) the shark
- (iii) the swimmer
- (iv) the hot air balloon
- (v) the seabed
- (vi) the plane
- (vii) the diver
- (viii) the submarine
- (ix) the cloud.

- b How far is :-

- (i) the seagull above the swimmer
- (ii) the diver below the swimmer
- (iii) the balloon above the seagull
- (iv) the submarine below the shark
- (v) the plane below the cloud
- (vi) the plane above the diver
- (vii) the shark below the seagull
- (viii) the seagull below the plane
- (ix) the cloud above the diver
- (x) the submarine below the cloud ?

5. We previously learned how helpful the drawing of a thermometer could be in carrying out integer calculations.

*Copy the thermometer shown opposite into your jotter and use it to help you do the following :-*

Find the temperature that is :-

- |   |  |
|---|--|
| a $5^{\circ}\text{C}$ up from $9^{\circ}\text{C}$     | b $23^{\circ}\text{C}$ up from $0^{\circ}\text{C}$     |
| c $14^{\circ}\text{C}$ up from $18^{\circ}\text{C}$   | d $9^{\circ}\text{C}$ down from $21^{\circ}\text{C}$   |
| e $15^{\circ}\text{C}$ down from $15^{\circ}\text{C}$ | f $8^{\circ}\text{C}$ up from $-3^{\circ}\text{C}$     |
| g $10^{\circ}\text{C}$ down from $-6^{\circ}\text{C}$ | h $16^{\circ}\text{C}$ up from $-9^{\circ}\text{C}$    |
| i $7^{\circ}\text{C}$ down from $4^{\circ}\text{C}$   | j $42^{\circ}\text{C}$ down from $0^{\circ}\text{C}$   |
| k $14^{\circ}\text{C}$ down from $-6^{\circ}\text{C}$ | l $40^{\circ}\text{C}$ down from $-20^{\circ}\text{C}$ |
| m $8^{\circ}\text{C}$ up from $-15^{\circ}\text{C}$   | n $25^{\circ}\text{C}$ up from $-30^{\circ}\text{C}$ . |

6. Look carefully at your thermometer.

Can you see that  $2^{\circ}\text{C}$  is  $8^{\circ}\text{C}$  up from  $-6^{\circ}\text{C}$ ?

Copy and complete these in the same way :-

- |  |  |
|--|--|
| a $24^{\circ}\text{C}$ is ..... from $20^{\circ}\text{C}$  | b $3^{\circ}\text{C}$ is ..... from $17^{\circ}\text{C}$     |
| c $0^{\circ}\text{C}$ is ..... from $40^{\circ}\text{C}$   | d $15^{\circ}\text{C}$ is ..... from $-10^{\circ}\text{C}$   |
| e $-17^{\circ}\text{C}$ is ..... from $0^{\circ}\text{C}$  | f $3^{\circ}\text{C}$ is ..... from $-4^{\circ}\text{C}$     |
| g $-21^{\circ}\text{C}$ is ..... from $-4^{\circ}\text{C}$ | h $-11^{\circ}\text{C}$ is ..... from $11^{\circ}\text{C}$   |
| i $21^{\circ}\text{C}$ is ..... from $-20^{\circ}\text{C}$ | j $-35^{\circ}\text{C}$ is ..... from $35^{\circ}\text{C}$ . |

7. The temperature in the conservatory is  $-4^{\circ}\text{C}$ .  
The living room in the house is  $23^{\circ}$  warmer.

What is the temperature in the living room ?



8.



As the plane rose from the airport into the sky, the outside temperature fell by a steady amount every 1000 metres.

At ground level, the temperature was  $25^{\circ}\text{C}$  and it fell by  $10^{\circ}\text{C}$  for every 1000 metres ascent.

What was the temperature at :-

- |               |                   |
|---------------|-------------------|
| a 1000 metres | b 3000 metres     |
| c 5000 metres | d 10 000 metres ? |

9. When "Captain Icicle" breezes past, the temperature drops by  $105^{\circ}\text{C}$  !

This man was fishing in a daytime  $30^{\circ}\text{C}$  heat, but did not notice Captain Icicle passing by.

To what temperature did his surroundings drop ?

