**Science Skills**

**Reading Line Graphs**

**Level 3
Book 2**

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**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Line Graphs**

**Line graphs** are used to **track** things when changes have been made.
**Example**:
The line graph below shows the temperature in Edinburgh and in Rome on 14th May.

Study the line graph.
Can you see how the following statements were inferred from the graph?

1. **Recognising what is being compared**
a) the temperatures in two cities at different times of day are being compared
b) the temperature in the individual cities at different times of day are being compared

2. **Finding data**
The temperature in Edinburgh at noon is 15ºC
The temperature in Rome at 6am is 17ºC
The temperature in Rome is lowest at 6am
The temperature in Edinburgh is highest at 2pm
If the temperature is 9º, it must be 6am in Edinburgh

3. **Calculating differences from the data**
At 10am, the temperature in Rome is 8º higher than the temperature in Edinburgh
At 4pm, the temperature in Edinburgh is 12.5º less than the temperature in Rome.

4. **Recognising trends** (A *trend* is the way things are going)
In both cities, the temperature rises between 6am and 2pm, then the temperature falls.

5. **Drawing conclusions**
At all times of day, the temperature in Rome is higher than the temperature in Edinburgh
Between 6am and 2 pm, the later in the day, the higher the temperature in both cities.
Between 2pm and 6pm, the later in the day, the lower the temperature in both cities.

6. **Predicting**At 8 pm in Rome the temperature is likely to be less than 24ºC.
In Edinburgh at 4am, the temperature is likely to be less than 9ºC

12. Pure water boils at **100ºC.**
 The following equipment was used to investigate the effect that adding salt has on
 the boiling point of water.





By how much is the boiling point of water **raised** when 60g of salt is added?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ºC

13 When food is digested in the body, proteins are broken down by enzymes.

 Which graph shows that the enzymes work fastest at 37ºC?

 Graph \_\_\_\_ shows that the enzymes work fastest at 37ºC.

14. The pulse rate of a student was recorded before, during and after two minutes of exercise. The results are shown in the graph.



What was the time taken for his pulse rate to return to normal after the exercise has stopped? (Tick)

a) 8 minutes b) 10 minutes c) 12 minutes d) 16 minutes

15. The graph shows the effect of temperature on the germination of oat seeds and
 barley seeds.



What is the average time for oat seeds to germinate at 5ºC? (tick)

a) 5 days b) 6 days c) 7 days d) 10 days

16. During yoghurt making, the pH of milk changes as shown in the graph.



During which period of time was there the greatest change in pH? (Tick)

a) 0-6 hours b) 6-12 hours c) 12-18 hours d) 18-24 hours

17. The graph shows the volume of liquid remaining after adding different concentrations
 of rennet to samples of milk.



Which concentration of rennet (mg/100cm3) left the **smallest** volume of liquid?

a) 2 b) 10 c) 20 d) 90

18 The graph shows the changes in oxygen concentration before and after waste whey was put into a river.

a) At which sample point was the oxygen concentration highest

 A, B, C or D? \_\_\_\_\_

b) Complete the sentence using one phrase from the box

 increases then stays the same increases and then decreases
 decreases and the stays the same decreases and then increases

**After waste whey is released into a river, the oxygen concentration \_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

19 A pupil measured the **voltage** produced by a solar cell at different **light intensities**.

a) Draw **one** conclusion from these results.

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b) What is the voltage produced when the light intensity is 80 units?
 \_\_\_\_\_mV

c) What light intensity gives a voltage of 14mV?
 \_\_\_\_\_ units

20 The graph shows the pulse rate of a 16 year old girl before, during and after exercise.



a) What was the girl’s resting pulse rate? \_\_\_ beats per minute

b) What was the girl’s maximum pulse rate? \_\_\_ beats per minute

c) Fill in **two letters** in the sentence below (A, B, C, D) to show the part of the graph which
 shows her recovery time

**Her recovery time is shown between points \_\_\_\_\_\_ and \_\_\_\_\_\_.**

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a) State the **lowest** temperature at which both detergents were equally effective.

 \_\_\_\_\_\_ºC

b) At which temperature did the non-biological detergent **remove** 80% of the stain?

 \_\_\_\_\_ºC