Science Skills

Level 3

Reading Tables Book 1



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

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

 **Tables**

**Tables** are used to display the results of an investigation.

Tables are used to **compare** things.
They show the **relationship** between two or more things.

It is very important to read the headings carefully.

The table below shows the number of units of alcohol in some common drinks.
The things being compared are the **drinks** and the **number of units of alcohol**.
You know what things are being compared because they are in the **headings.**

In this table the headings are in italics.

  **Headings**



Before you begin to look at the question, you should **read** the **whole table**. You should put it into **sentences**, building in the **headings**. Read it aloud if this helps.

*Example:*

In the drink 1 bottle of alcopop there are 2.0 units of alcohol.
In the drink 1 pint of lager, there are 2.3 units of alcohol.
In the drink 1 glass of wine, there are 2.1 units of alcohol.
In the drink 1 pint of cider, there are 3.0 units of alcohol.
In the drink 1 measure of spirits, there are 1.4 units of alcohol.

Once you have done this it should be very easy to **find** any information that you need for the questions.

Since you are working at **Level 3**, you are expected not only to find information in a table, but also to use the information to do a **calculation**.

Some of the most common types of calculation are on the following page.

**Remember:**
Look very, very closely at the questions. Some of them can be tricky.

**Interpreting the Tables**

You are expected to do the following:

1. **Extract information** directly from the table.

2. Find the relevant information and then **add**, **subtract** or **multiply**.

3. **Divide**.
Questions which start “*How many times greater*…” or “*How many times more*…” usually require you to divide.

4. **Percentages.**
Remember that *per cent* means *out of a hundred*. The symbol is **%**.
So 54% means 54 out of a hundred.

The calculation should be as follows:
**The number you have been asked about ÷ the total number x 100**

*Example*:

Calculate the percentage of students studying biology in the student group below:

|  |  |
| --- | --- |
| Subject | Number of Students |
| Medicine | 8 |
| Biology | 2 |
| Engineering | 4 |
| Mathematics | 6 |

 Number of students studying biology 2
Total number of students 20
(The number you have been asked about (**2**) **÷** the total number (**20**) **x** **100**)
2 ÷20 x 100 = **10%**

5. **Averages**
**Add up all the numbers in the category and divide by the number of entries.**

 Example:

Calculate the **average** mark achieved by Brian in the tests.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Name of student* | *Test 1* | *Test 2* | *Test 3* | *Test 4* | *Test 5* |
| Linda | 55 | 62 | 60 | 64 | 64 |
| Brian | 39 | 39 | 45 | 48 | 49 |
| Melanie | 46 | 51 | 53 | 59 | 65 |
| John | 76 | 79 | 79 | 81 | 85 |

 Brian’s marks were 39 + 39 + 45 + 48 + 49 = 220
(There were 5 tests)
219 ÷ 5 = **44**

6. **Draw Conclusions**
***Draw conclusions*** means ***write what you have found out*** from the table.

 *Example*:

 A student carried out an investigation to find out how long it took two substances to dissolve; first in water at 30ºC, then at 60ºC, then at 80ºC.

 The results are in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| *Substances* | *30 ºC* | *60ºC* | *80ºC* |
| **A** | 20 minutes | 15 minutes | 8 minutes |
| **B** | 11 minutes | 9 minutes | 3 minutes |
| **C** | 30 minutes | 22 minutes | 14 minutes |
| **D** | 15 minutes | 10 minutes | 4 minutes |
| **E** | 35 minutes | 21 minutes | 13 minutes |

**What conclusions can you draw from the results?**

*You have to compare the substances and the times.

As you* ***read the table*** *aloud in* ***sentences****, you become aware that as the temperature is getting higher, the number of minutes is getting smaller.
For example: “Substance C dissolves in 30 minutes at 30ºC. It dissolves in 22 minutes at 60ºC and it dissolves in 14 minutes at 80ºC.”*

 *Since the student wanted to know how quickly the substances dissolved, the conclusions will include words such as****fastest, slowest, faster than, slower than, largest, smallest, increase, decrease****, etc.*

***The conclusion is what you found out****. There are lots of things you could write.
All the answers below are correct.
The more ‘****scientific’*** *ways of writing the conclusions are in* ***red****.*

* Substance B dissolved faster than all the rest at 30ºC
* Substance E was the slowest to dissolve at 30ºC
* All the substances dissolved at a different rate, no matter what the
temperature was.
* Substance A took longer to dissolve at 60ºC than Substances B and D.
* All the substances dissolved faster as the temperature increased.
* **The lower the temperature, the more slowly the substances dissolve.**
* **As the temperature increases, all the substances dissolve more
quickly.**
* **The greater the temperature, the faster the speed of dissolving.**

7. **Predict**Tables are used to **predict**.

**‘Predict’ means use the information in the table to make an intelligent guess about something which is not in the table.**

After you have read the table in sentences, you will have noticed that the numbers are going up, going down or staying more or less the same.

*Example:*A student carried out an investigation to find out how long it took two substances to dissolve first in water at 30ºC, then at 60ºC, then at 80ºC.

 The results are in the table below.

70ºC

|  |  |  |  |
| --- | --- | --- | --- |
| *Substances* | *30 ºC* | *60ºC* | *80ºC* |
| **A** | 20 minutes | 15 minutes | 8 minutes |
| **B** | 11 minutes | 9 minutes | 3 minutes |
| **C** | 30 minutes | 22 minutes | 14 minutes |
| **D** | 15 minutes | 10 minutes | 4 minutes |
| **E** | 35 minutes | 21 minutes | 13 minutes |

**Predict the number of minutes Substance C would have taken to dissolve if the temperature of the water was 70ºC.**

What to do:

*1. Find the data for Substance C in the table. (now coloured)*

*2. Decide where in the table 70ºC would be. (now marked)*

3. *The answer at Level 3 is* “**Between 22 minutes and 14 minutes**”.
*You do not have to guess an exact number. (If you did, it would be 18ºC or 19ºC.)*

If you are asked to predict the number of minutes Substance C would have taken to dissolve at **100ºC**, the answer would be “**Less than 14 minutes**”.
If you wanted to be more exact (though this is not usually necessary at Level 3) the answer would be 6ºC or 7ºC.

1. Some insects help gardeners by eating pests which attack their plants.
 The table below shows some of these beneficial (good) insects and the pests they eat.



 Aphids

Which two beneficial insects eat aphids?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Compounds containing calcium, iron and copper must be soluble in water to be good
 fertilisers.
 The table below shows the effect of soil pH on the solubility of compounds.



At what pH are all of the compounds soluble? Soil pH \_\_\_\_\_\_\_\_\_

3. A person’s pulse rate can be used as a guide to their level of fitness, as shown in the
table below.

State the level of fitness of a person with a resting pulse rate of 48 beats per minute.

Level of fitness is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. The table below shows how often a sample of Scottish students take exercise.

Tick the statement below which is correct:

A Fewer females exercise once a month than males.

B More males exercise once a week than females.

C Fewer females exercise daily than males.

D More males exercise 2 – 3 times a week than females.

5. The table below shows the results of an investigation into the removal of stains.



Tick the statement which is correct:

A Grass stains were removed by a biological detergent at 40ºC

B Grass stains were removed by a biological detergent at 100ºC

C Grass stains were removed by a non-biological detergent at 40ºC

D Grass stains were removed by a non-biological detergent at 40ºC

6. Males have, on average, between 15% and 17% body fat.
 Females have, on average, between 18% and 22% body fat.

 The table below gives average percentage of body fat for athletes in four sports.



In which sport do the athletes have a higher than average percentage of body fat?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. The table below shows the temperature ranges in which different types of yeast can
 grow.



Which types of yeast will **not** grow at 16ºC? (Tick)

A Types 1 and 3

B Types 1 and 4

C Types 2 and 3

D Types 3 and 4

8. The table below shows the temperatures required before and during the germination
 of four types of seeds.

**Fully** describe the changes in temperature required for Fraxinus seeds to germinate.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9. The results of an investigation into the benefits of using *protected cultivation* are
 shown in the table below.



Calculate how much money **was saved** on pesticides by using *protected cultivation*.

Working

 Answer: £\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Bees are beneficial insects. (They do a lot of good.)
 The number of bees visiting a garden in the years 2000 and 2010 is shown in the table.



Calculate how many times greater was the number of bees that visited the garden in 2000 compared to 2010.

Working

 Answer: There were \_\_\_\_\_\_\_ times more bees.

11. The table below shows the number of units in some common drinks.



How many units of alcohol have been taken in by a person who drinks **3 pints of cider**?

 Working

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ units

12. The table below compares the content per 100cm3 of full fat milk and evaporated milk.





a) What is the protein content of evaporated milk? \_\_\_\_\_\_\_\_\_\_ g/100cm3

b) How many times more **sugar** is there in 100 cm3 of evaporated milk compared to
 100cm3 of full fat milk?

 Working

Answer: \_\_\_\_\_\_\_ times more sugar

13. A group of students investigated the number of caddis fly larvae living in a river.
 They counted the number of caddis fly larvae in water samples from five points in
 the river. They measured the speed of the river at each point.
 Their results are shown in the table below.



Complete the conclusion below by filling in the correct answer from the box:

 **increases
 decreases
 stays the same**

**As the speed of the river increases, the number of caddis fly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

14. The table below shows the number of drug-related deaths in Scotland over a
 five-year period.



Tick the correct statement:

A The table shows that the number of drug-related deaths increases

B The table shows that the number of drug-related deaths decreases

C The table shows that the number of drug-related deaths stays constant (the same)

D The table shows that there is no general trend in the number of drug-related deaths.
 (*Trend means the way that things are going*)

15. The table below shows information about recycled waste, and waste dumped in
 land-fill sites over a five-year period.



Complete the conclusion below by filling in the correct answer from the box:

 **increases
 decreases
 stays the same**

**As the amount of recycled waste increases, the amount of waste dumped in land-fill

sites \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

16. The table below shows the power generated by a wind turbine at different wind speeds.



a) Complete the conclusion below by filling in the correct answer from the box:

 **increases
 decreases
 stays the same**

**As the wind speed increases, the power generated \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

b) Predict the power generated when the wind speed is 13m/s.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kW

17. The daily energy needs of children of different ages are shown in the table.

One conclusion that can be drawn from these results is that **males have a higher daily energy need than females.**

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

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Predict the daily energy need of a female aged 9 years

 Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kcal

18. The table below shows the size of bulbs and how deep they should be planted.



a) Which bulb is 3cm in size? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Which bulb should be planted at the greatest depth? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) Draw **one conclusion** from the information in the table.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

d) Another bulb has a size of 4cm. Predict the depth at which this bulb should be planted.

 \_\_\_\_\_\_\_\_\_\_\_\_cm

19. The table shows how changing the percentage of tin can alter the melting point
 of solder.



a) What effect does increasing the percentage of tin have on the melting point of solder?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Another type of solder contains 55% tin. Predict the temperature at which this solder will melt.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ºC

20. An experiment was set up to find out the effect of light on the production of oxygen from a
 plant. A lamp was placed at different distances and the number of oxygen bubbles
 produced in one minute were counted.

 The results are in the table below.

a) Complete the sentence below using either **increases** or **decreases.**

**As the distance of the lamp from the plant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the number of

bubbles of oxygen gas produced in one minute \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

b) Predict the number of bubbles of oxygen produced if the lamp was 120 cm from the
 plant.

 \_\_\_\_\_\_\_\_\_\_\_\_ bubbles

21. Water type varies around the country. It can be “soft”, “medium” or “hard”.
An experiment was carried out to investigate the effect of water type on stain removal. Three beakers were set up. Each beaker had a stained cloth, detergent and water.
Each beaker had a different type of water.





The beakers were left under identical conditions and the percentage of stain removed was measured. The results are shown in the table.

What conclusion can be drawn from the results?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

22. The recommended percentages of different substances in the human body are shown
 in the table below.



 What is the recommended percentage of fat in
 the human body?

 Fill it into the table.

 Working

23. The table shows the blood group of a number of students.

 Calculate the percentage of students with blood group O.


 Working

 Answer: \_\_\_\_\_\_\_\_\_%

24. Four students made **two** measurements of their vital capacities.

Which student had an **average** vital capacity of 4100cm3?

Working

Answer: Student \_\_\_\_\_

25. A student, when at rest, measured her heart rate **three times** using a stethoscope
 and a stopwatch. The results are in the table.



Calculate the student’s **average** heart rate in 20 seconds.

 Working:

Answer: \_\_\_\_\_\_\_\_\_\_ beats per 20 seconds