

Science Skills

Level 3

Reading Tables Book 1

<i>Drink</i>	<i>Alcohol (units)</i>
1 bottle of alcopop	2·0
1 pint of lager	2·3
1 glass of wine	2·1
1 pint of cider	3·0
1 measure of spirits	1·4

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	
<i>Drink</i>	<i>Alcohol (units)</i>
1 bottle of alcopop	2·0
1 pint of lager	2·3
1 glass of wine	2·1
1 pint of cider	3·0
1 measure of spirits	1·4

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**)
 $2 \div 20 \times 100 = \underline{\mathbf{10\%}}$

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 $39 + 39 + 45 + 48 + 49 = 219$
 (There were 5 tests)
 $219 \div 5 = \underline{\mathbf{44}}$

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 30°C, then at 60°C, then at 80°C.

The results are in the table below.

<i>Substances</i>	<i>30 °C</i>	<i>60°C</i>	<i>80°C</i>
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 30°C. It dissolves in 22 minutes at 60°C and it dissolves in 14 minutes at 80°C."

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 30°C
- Substance E was the slowest to dissolve at 30°C
- All the substances dissolved at a different rate, no matter what the temperature was.
- Substance A took longer to dissolve at 60°C 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 30°C, then at 60°C, then at 80°C.

The results are in the table below.

<i>Substances</i>	<i>30 °C</i>	<i>60°C</i>	<i>80°C</i>
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 70°C.

What to do:

1. Find the data for Substance C in the table. (now coloured)
2. Decide where in the table 70°C 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 18°C or 19°C.)

If you are asked to predict the number of minutes Substance C would have taken to dissolve at **100°C**, 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 6°C or 7°C.

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.

<i>Beneficial insect</i>	<i>Pests eaten</i>
hover flies	leaf hoppers, caterpillars
ground beetles	snails, slugs
ladybirds	aphids
wasps	caterpillars, grubs
lacewings	aphids



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.

Metal in compound	Soil pH						
	3	4	5	6	7	8	9
calcium	soluble					insoluble	
iron	soluble			insoluble			
copper	insoluble		soluble			insoluble	

Key



soluble



insoluble

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.

<i>Resting Pulse Rate</i> (beats per minute)	<i>Level of Fitness</i>
Below 50	Outstanding
50 – 60	Good
61 – 90	Normal
Above 90	Poor

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.

<i>Frequency of exercise</i>	<i>Number of students</i>	
	<i>Male</i>	<i>Female</i>
Daily	35	20
2–3 times a week	25	30
Once a week	7	18
Once a month	3	9

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.

<i>Type of stain</i>	<i>Washing temperature (°C)</i>	<i>Biological detergent</i>	<i>Non-biological detergent</i>
Grass	40	✓	×
Mud	40	✓	×
Grass	100	×	×
Mud	100	✓	✓

✓ = stain removed

× = stain not removed

Tick the statement which is correct:

- A Grass stains were removed by a biological detergent at 40°C
- B Grass stains were removed by a biological detergent at 100°C
- C Grass stains were removed by a non-biological detergent at 40°C
- D Grass stains were removed by a non-biological detergent at 40°C

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.

	<i>Sport</i>	<i>Average body fat of athletes (%)</i>	
		<i>Male</i>	<i>Female</i>
A	Swimming	10	16
B	Running	9	12
C	Volleyball	11	16
D	Shotput	18	24

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.

<i>Type of yeast</i>	<i>Temperature range (°C)</i>
1	14–16
2	12–30
3	18–35
4	8–15

Which types of yeast will **not** grow at 16°C? (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.

<i>Type of seeds</i>	<i>Temperature required before germination</i>	<i>Temperature required during germination</i>
Anemone	warm or cold	warm
Fraxinus	warm, then cold	warm
Smilacina	cold, then warm, then cold	warm
Erythronium	cold	cold

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

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

	<i>Without protected cultivation</i>	<i>With protected cultivation</i>
Cost of pesticides (per hectare/year)	£9 500	£6 400
Yield (tonnes per hectare/year)	125	375

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.

	<i>Year</i>	
	<i>2000</i>	<i>2010</i>
Number of bees visiting the garden	240	60

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.

<i>Drink</i>	<i>Alcohol (units)</i>
1 bottle of alcopop	2·0
1 pint of lager	2·3
1 glass of wine	2·1
1 pint of cider	3·0
1 measure of spirits	1·4

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.

<i>Content</i>	<i>Full fat milk</i> (g/100 cm ³)	<i>Evaporated milk</i> (g/100 cm ³)
protein	3	8
sugars	4	12
fat	4	8
minerals	less than 1	less than 1



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.

<i>Speed of river (cm/s)</i>	50	100	150	200	250
<i>Number of caddis fly larvae</i>	15	20	50	70	80

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.

Year	Number of drug-related deaths
1	153
2	209
3	247
4	251
5	267

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.

<i>Year</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>
<i>Recycled waste (million tonnes)</i>	5	6	8	10	13
<i>Waste dumped in land-fill sites (million tonnes)</i>	160	150	130	110	90

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.

<i>Wind speed (m/s)</i>	7.5	9	10	11	12	14
<i>Power generated (kW)</i>	100	200	300	400	500	600

- 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.

<i>Age (years)</i>	<i>Daily energy needs (kcal)</i>	
	<i>Males</i>	<i>Females</i>
1	1300	1200
4	1800	1700
7	2000	1900
11	2500	2100
15	3000	2200

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.



<i>Bulb</i>	<i>Size of bulb (cm)</i>	<i>Depth of planting (cm)</i>
Snowdrop	2	6
Tulip	3	9
Hyacinth	5	15
Daffodil	8	24

- 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.

Solder	Percentage of tin	Melting point in °C
A	40	260
B	50	227
C	67	190

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

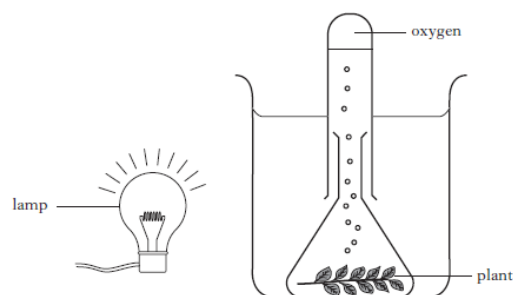
- b) Another type of solder contains 55% tin. Predict the temperature at which this solder will melt.

_____ °C

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.

Distance of lamp from plant in cm	Number of bubbles of oxygen produced in one minute
30	24
40	19
60	10
100	4



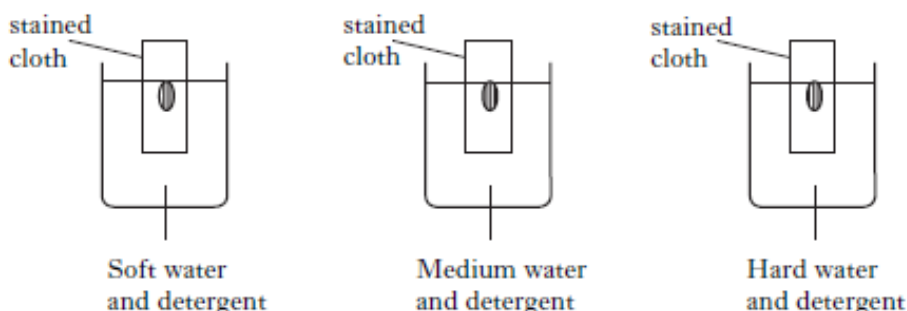
- a) Complete the sentence below using either **increases** or **decreases**.

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.

<i>Water type</i>	<i>Percentage of stain removed</i>
Soft	90
Medium	79
Hard	62

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.

<i>Substance</i>	<i>Recommended percentage (%)</i>
Protein	14
Fat	
Carbohydrate	1
Water	63
Minerals	2
Total	100

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

<i>Blood group</i>	<i>Number of students</i>
A	4
B	4
O	11
AB	1

Answer: _____%

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

<i>Student</i>	<i>Vital capacity (cm³)</i>	
	<i>First measurement</i>	<i>Second measurement</i>
A	3980	4020
B	4000	4200
C	4100	4120
D	4125	4100

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.



<i>Measurement</i>	<i>Number of beats in 20 seconds</i>
1	21
2	21
3	24

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

Working:

Answer: _____ beats per 20 seconds