**Science Skills**

**Reading Tables**

**Level 4**

**Book 1**

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

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

**Tables**

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

1. Tables are used to **compare** things.
They show the **relationship** between two or more things.
At Level 3 this is usually only one aspect of the things to be compared.

***Level 3*** This table shows the power generated by a wind turbine at different wind speeds.



**Data**

  **Headings**

You read this table like this:

When the **wind speed** is **7.5** *metres per second*, the **power generated** is **100** *kilowatts*.
When the wind speed is 9 metres per second, the power generated is 200 kilowatts.
When the wind speed is 10 metres per second, the power generated is 300 kilowatts. Etc.

At **Level 4** you will often find a number of aspects compared in the same table.

***Level 4*** The same amount of energy was used to heat up samples of iron and aluminium. The table shows the results of the experiments.

The **headings** are the most important part of a table. Without headings, the table is meaningless.

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Two metals are being **compared**, aluminium and iron.

In the investigation, three masses of each metal were heated; 1kg, 2kgs and 3 kgs.

This is the **variable** which changed.

The *specific heat capacity* is the **aspect of the metals** which the scientist considers relevant to the investigation.

The **temperature rise** was the information that was unknown before the investigation but has now been found out.



It is usually helpful to read the information aloud, in **sentences**, across the table, **building in the headings**.
For example, from the table you can see that…

* The first metal is **aluminium**, which has the specific heat capacity of **900 J/kg/ºC**. When you heat **one kilogram**, the temperature rise is **11ºC**.
* The other metal is **iron** which has the specific heat capacity of **450 J/kg/ºC**. When you heat **one kilogram**, the temperature rise is **22ºC**.

**Drawing Conclusions**You have to draw conclusions from tables. You do this by **comparing the data** in the table. Words used include “more than”; “greater than”; “less than”; “increasing”; “decreasing” etc.
In the examples below, the **conclusion** is the sentence **in red**. It starts with the word “**So**”.
The **evidence** is the rest of the paragraph.

 a) Compare the **temperature rise** and the **metals**

* The **temperature rise** for **one kg** of aluminium is **11ºC**; the temperature rise for one kg of iron is **22ºC**.
***So*** the temperature rise of iron is **double** the temperature rise of aluminium.
(The temperature rise of aluminium is **half** the temperature rise of iron.)
* The temperature rise of aluminium is **also half** of the temperature rise of iron when **2 kilograms** are heated, and **just over half** when **3 kilograms** are heated.

b) Compare the **temperature rise** and the **mass**
* The temperature rise for one kilogram of aluminium was **11ºC**; for 2 kilograms it was **5.5ºC**; and for 3 kilograms it was **3.7ºC**.
***So*** the temperature rise decreases as the mass heated increases. (The temperature rise gets smaller as the mass gets bigger.)
* The temperature rise for iron **also** decreases as the mass heated increases.

c) Compare the **specific heat capacity** of the **metals**

* The specific heat capacity of aluminium is **900 J/kg/ºC.** The specific heat capacity of iron is **450 J/kg/ºC** **. *So* the specific heat capacity of aluminium is higher than the specific heat capacity of iron.**

**Predicting from a Table**

Tables are used to **predict**. Predictions are sometimes called **projections**.

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

Example:

You have the table and the question is:
 **Stainless steel has a specific heat capacity of 510 J/kg/ºC.
 Predict the temperature rise when the same amount of energy is used to heat
 1.0 kg of stainless steel.**

*What to do:*

1. Stainless steel does not appear in the table. Look for the information you are given
about stainless steel in the question to decide where it would go in the table.

2. You are told that stainless steel has a specific heat capacity of 510 J/kg/ºC. This is less than aluminium and more than iron, so it would go between them in the table.

 **Stainless steel 510 1.0**

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3. You are told that 1.0 kg of stainless steel is heated. Work out where this would go.

4. The temperature rise for 1 kg of aluminium was 11ºC. The rise for iron was 22ºC.
 Stainless steel must be somewhere in between, higher than 11 but lower than 22.

 At Level 4, the correct answer to this question is “between 11ºC and 22ºC”

1. Cactus plants have fleshy stems covered with spines. Many cactus plants
 produce flowers.





Use the information in the table and the bar chart to answer the following questions.

a) Which cactus plant has an average height of 5 metres and has yellow flowers?

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

b) What is the average height of the cactus plant with white spines and red flowers?

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

c) Two of the cactus plants have pink flowers. Which one has the greater average
 height?

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

d) Name and describe the cactus plant with an average height of 4 metres.

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

 Description: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2.



Use the information in the table and the bar graph to answer the following questions.

a) Which food has a fat content of 0.2g and an energy content of 1060kJ?

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

b) What is the fat content of the food with an energy content of 820kJ?

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

c) What is the energy content of the food with a sugar content of 7.9g?

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

3.

Use the information in the table and the bar graph to answer the following questions.

a) In which **country** is the longest bridge?

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b) What is the **span** of the cantilever bridge?

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c) What is the **total length** of the bridge with a span of 500m?

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d) What **conclusion** can be drawn about the total length and span of these bridges?

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4. The graph shows some information about poisonous snakes.





Use the information in the graph and the table to answer the following questions.

a) Which of the snakes found in South East Asia injects more venom per bite?

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b) What is the death rate of people bitten by the snake which injects 50mg of venom
 per bite?

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

c) Calculate the number of lethal doses of venom that a Black Mamba snake injects
 in a single bite

 Working Number of lethal doses: \_\_\_\_\_\_\_\_\_\_

5. The same amount of energy was used to heat up samples of iron and
 aluminium.

 The table shows the results of the experiments.



Here is one conclusion from these results.

 *If the same mass of metal is heated, the temperature rise for aluminium is
 less than the temperature rise for iron.*

Draw **two** other conclusions from these results.

a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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c) Stainless steel has a specific heat capacity of 510 J/kg/ºC.
 Predict the **temperature rise** when the same amount of energy is used to heat
 1.0 kg of stainless steel.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ºC

6. The table shows information about the percentage of adults in Scotland who
 are overweight.



Draw two conclusions from this information.

a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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7. Dylan investigated how much energy was used to heat the water for his bath.
 His results are shown in the table below.



a) Draw two conclusions from these results.

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b) Predict the amount of energy used to heat 200 litres of water to a
 temperature of 43ºC.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ MJ

8. Toads feed on insects.
 They will only snap at and eat moving insects.
 During an investigation a hungry toad was offered insects
 hanging on a thread.



Use the information in the tables to answer the following questions.

a) Which insect has black and yellow stripes and is harmless?

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

b) Which insect is snapped at and eaten by the toad and is all black?

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

c) During the investigation, the toad’s response to one of the insects changed.
 To which insect did the toad change its response?

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

d) Explain why the toad changed its response to this insect.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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9. Ammonia is an important gas used to make fertilisers.
 The table shows some information about the process used to make ammonia.

a) Draw two conclusions from this information.

 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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 2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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b) Predict the rate of ammonia production when the temperature used is 600ºC and
 the pressure is 100 bar.

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg/min

10. Some information about four alloys containing copper is shown below.

 Use all of the information to answer the following questions.



a) State the use of the alloy which contains 90% copper.

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b) What is the percentage of copper in the alloy used to make water pumps?

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

c) What is the percentage of mercury in dental amalgam?

 Working Answer \_\_\_\_\_\_\_\_%

11. A group of pupils investigated the level of air pollution in a town

 They counted how many types of lichen were growing on trees at four
 different sites.
 For each site, they recorded the percentage lichen cover and the distance
 from the town centre.

 Their results are in the table below.



a) Which site was most polluted?

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

b) Draw two conclusions from the results.

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12. Ben investigated how the thickness of different wires affects their electrical
 resistance.



 a) Draw two conclusions from these results.

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b) A wire with a thickness of 0.24mm had an electrical resistance of 1.63 ohms.
 From which material was the wire made?

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