Numeracy Skills for Science
Reading Tables - Level 4 – Book 1

Task 1 – Reading The Information in a Table

Read the following information about tables.

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.

Headings		Data

Wind speed (m/s)	7·5	9	10	11	12	14
Power generated (kW)	100	200	300	400	500	600

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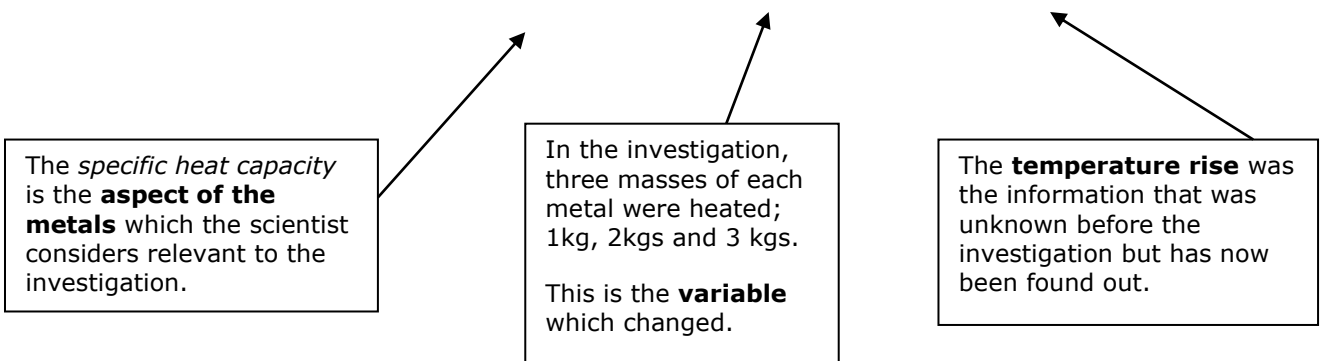
At **Level 4** you will often find a number of aspects compared in the same table.

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.

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

Metal	Specific heat capacity (J/kg/°C)	Mass of metal (kg)	Temperature rise (°C)
Aluminium	900	1·0	11·0
Aluminium	900	2·0	5·5
Aluminium	900	3·0	3·7
Iron	450	1·0	22·0
Iron	450	2·0	11·0
Iron	450	3·0	7·3

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

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

This is the **variable** which changed.

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

Metal	Specific heat capacity (J/kg/°C)	Mass of metal (kg)	Temperature rise (°C)
Aluminium	900	1·0	11·0
Aluminium	900	2·0	5·5
Aluminium	900	3·0	3·7
Iron	450	1·0	22·0
Iron	450	2·0	11·0
Iron	450	3·0	7·3

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/°C**. When you heat <u>**one kilogram**</u>, the temperature rise is **11°C**.
- The other metal is **iron** which has the specific heat capacity of **450 J/kg/°C**. When you heat <u>**one kilogram**</u>, the temperature rise is **22°C**.

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 **11°C**; the temperature rise for one kg of iron is **22°C**.
  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:

Metal	Specific heat capacity (J/kg/°C)	Mass of metal (kg)	Temperature rise (°C)
Aluminium	900	1·0	11·0
Aluminium	900	2·0	5·5
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Iron	450	1·0	22·0
Iron	450	2·0	11·0
Iron	450	3·0	7·3

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.

Metal	Specific heat capacity (J/kg/°C)	Mass of metal (kg)	Temperature rise (°C)
Aluminium	900	1·0	11·0
Aluminium	900	2·0	5·5
Aluminium	900	3·0	3·7
Stainless steel	**510**	**1.0**	
Iron	450	1·0	22·0
Iron	450	2·0	11·0
Iron	450	3·0	7·3

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"

Task 2 – Reading Tables Level 4 Book 1 Questions

The remainder of the level 4 book 1 provides questions on reading tables. This information is summarised in the table below.

Question	Content	Question	Content
1	Cactus Plants	7	Energy and Water
2	Food Samples	8	Toads and Insects
3	Famous Bridges	9	Ammonia and Fertilisers
4	Poisonous Snakes	10	Copper Alloys
5	Metals and Heat	11	Town Air Pollution
6	Obesity In Scotland	12	Wire Resistance

Your task is to answer the three table questions listed below.

Question	Content
8	Toads and Insects
9	Ammonia and Fertilisers
12	Wire Resistance

Numeracy Skills for Science
Reading Tables - Level 4 – Book 2

Task 1 – Reading The Information in a Table

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

Headings →

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← **Data**

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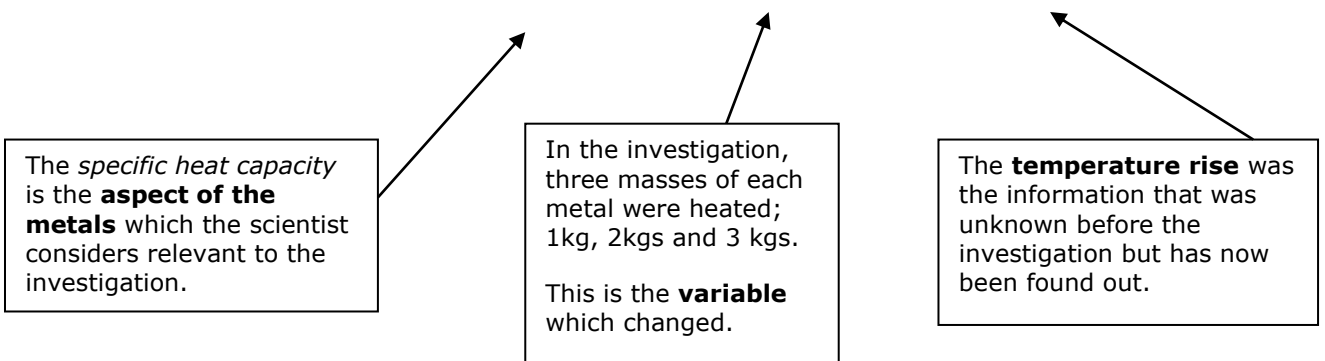When the wind speed is 10 metres per second, the power generated is 300 kilowatts.   Etc.

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.

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You have the table and the question is:

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Predict the temperature rise when the same amount of energy is used to heat
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Aluminium	900	3·0	3·7

Stainless steel   510   1.0

Iron	450	1·0	22·0
Iron	450	2·0	11·0
Iron	450	3·0	7·3

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"

Task 2 – Reading Tables Level 4 Book 2 Questions

The remainder of the level 4 book 2 provides questions on reading tables. This information is summarised in the table below.

Question	Content	Question	Content
1	Vaccines	7	Sulphur Trioxide
2	Steel Alloys	8	Wind Generator Power
3	Sperm Cell Production	9	Soil Moisture
4	Fibre Strengths	10	Fuel Octane
5	Distance Judgement	11	Carbondioxide Levels
6	Lichens and Pollution		

Your task is to answer the three table questions listed below.

Question	Content
1	Vaccines
4	Fibre Strength
10	Fuel Octane