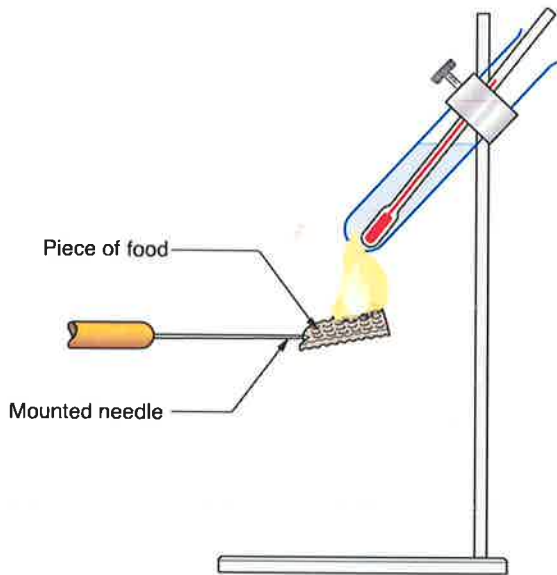


## Data interpretation: Worksheet 22

### Chapter 18: Food and energy

An experiment can be carried out to compare the energy values of different foods. In this experiment, a sample of food is set alight and the flame used to heat up water in a boiling tube. The temperature before and after the heating are noted so that the rise in temperature can be calculated.

The apparatus is shown in the diagram below.



Answers

The results obtained are shown in the table below.

Food sample	Starting temp in °C	Finishing temp in °C	Rise in temp in °C
Biscuit	20	54	34
Cake	20	59	39
Crisps	20	44	24
Cracker	20	37	17
Puffed potato snack	20	71	51
Rice cake	20	43	23

1. Calculate the rise in temperature for each food and complete the table.

2. Which food seemed to contain the most energy?

..... Puffed potato snack .....

3. What was the **input variable** for this experiment?

..... Food sample / type of food .....

4. What is the **outcome variable**?

..... Temperature (finishing) .....

5. State three variables that must be controlled variables if this is to be a **fair test**.

..... (1) Distance between food / water constant .....

..... (2) Same temperature of the water at start .....

..... (3) Same size / mass / amount of food sample .....

## Data interpretation: Worksheet 21

## Chapter 17: Reacting metals

Louis tested four metals to compare how well each of them would react with solutions of different metal nitrates.

1. Name three controlled variables Louis should have taken into account for this to be a fair test.

• same temperature

• same concentration

• same form of metal (i.e. all ribbon or all powdered)

2. Louis produced a table of results. If the metal reacted, he put a '+' into the table. If it did not react he put a '-' into the table. Here is the table of results:

Metal	Magnesium nitrate solution	Copper nitrate solution	Iron (III) nitrate solution	Zinc nitrate solution
Magnesium	-	+	+	+
Copper	-	-	-	-
Iron	-	+	-	-
Zinc	-	+	+	-

Before doing any of the experiments Louis knew where to put four '-' signs in the table. Put a circle around each of these '-' signs.

3. Use the information in the table to write down the reactivity series for the four metals. Put them in order from the **most** reactive to the **least** reactive.

Magnesium, Zinc, Iron, Copper

4. None of the metals in the table reacts with a solution of magnesium nitrate. Explain why this is the case.

magnesium is the most reactive metal  
so hangs onto the nitrate the tightest

5. Explain **one** way in which the reactivity series is useful to engineers.

to see if 2 metals put together might  
show preferential corrosion. e.g. Zinc  
blocks on an iron ship, the Zinc will corrode  
~~now~~ before the iron

## Data interpretation: Worksheet 24

### Chapter 25: Working out the seasons

David and Sarah were given the job of recording certain physical changes during one year at school. They were asked to measure the temperature, the time of sunrise and the time of sunset on four separate days, three months apart. Here are their results:

Season	Temperature in °C	Time of sunrise	Time of sunset	Day length
A	15	5.04	19.35	14.31
B	33	4.06	22.10	18.04
C	11	7.54	17.04	9.10
D	3	6.22	18.10	11.48

1. Calculate the day length for each of the seasons A, B, C and D and write your answers in the table above.
2. Use these day length figures to match up A, B, C and D with spring, summer, autumn and winter.

A - SPRING

B - SUMMER

C - WINTER

D - AUTUMN

3. Do your answers to question 2 fit in with the temperatures they measured, explain your answer?

NOT ALL SUMMER HIGHEST TEMP IS OK/EXPECTED.

WINTER TEMP IS HIGHER THAN THE AUTUMN

TEMP, AS SOME DAYS IN AUTUMN ARE COLDER

THAN SOME DAYS IN WINTER. TEMP ONLY

MEASURED ON ONE DAY - NOT AN AVERAGE.

4. Draw a diagram in the box below showing how the relationship between the Earth and the Sun can explain the different seasons.

