**Science Skills**

 **Level 3**

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

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

1. Use the information in the table to complete a **bar graph**.

|  |  |
| --- | --- |
| Source of Energy | Percentage of the World’s Energy (%) |
| Coal | 31 |
| Oil | 26 |
| Natural Gas | 19 |
| Renewable Energy | 20 |

Heading: Percentage of the World’s Energy from Various Sources
Scale on Y axis: Start at 0 at the bottom and go up in 5s.
Type of graph: Bar graph



2. Use the information in the table to complete a **bar graph**.

|  |  |
| --- | --- |
| Place | Summer Temperature (ºC) |
| Iceland | 10 |
| Shetland | 13 |
| Western Isles | 14 |
| Mainland Scotland | 15 |



3. Students were asked how much physical exercise they took in a week.

The results are in the graph below.

a) How many students did less than 30 minutes exercise per week?

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

b) How many students did between one hour and three hours exercise per week?

 Working:

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

c) How many students were asked in the survey?

 Working:

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

4. The bar graph shows the daily energy requirements of four male students.





5. A block of copper was heated in a water bath. The temperature of the copper block was
 noted every minute for five minutes. The results are shown in the table.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Time (minutes) | 0 | 1 | 2 | 3 | 4 | 5 |
| Temperature (ºC) | 20 | 30 | 38 | 44 | 48 | 52 |

 Present this information as a line graph.

* They knew the different **times** they were using, so these go on the X axis (along the bottom).
* The ‘**temperature’** results were: lowest – 20; highest - 52. So the scale starts at 0 at the bottom and goes up in 10s.

 Changes in Temperature of Copper over 5 minutes in Water



 0 1 2 3 4 5

6. Small organisms were fed chicken manure. The volume of biogas produced was
 measured over a period of five hours.

 The results are shown in the table.

|  |  |
| --- | --- |
| *Time in hours* | *Volume of Biogas in cm³* |
| 0 | 0 |
| 1 | 3 |
| 2 | 6 |
| 3 | 12 |
| 4 | 24 |
| 5 | 48 |

Show this information as a line graph. Remember that line graphs should be big enough to fit most of the graph paper given.

 Volume of Biogas Produced by Organisms over 5 Hours



7. Students took samples of leaves at different heights from an **oak tree** and a **sycamore tree**.
They recorded the **number of caterpillars** in each sample.

Their results are shown in the graph.

a) How many caterpillars were found in the leaf sample from the oak tree at a height
 of 15 metres?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ caterpillars

b) In a leaf sample collected at a height of 24 metres, there are 10 caterpillars.
 What type of tree did the sample come from?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ tree

8. The graph below shows the recommended daily allowance of Vitamin A and calcium
 for children of different ages.



a) Complete the **conclusion** below by inserting either **increases,** **decreases** or **stays the
 same.**

**As the age of a child increases, the recommended daily allowance

of calcium \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

b) **Calculate the** **increase** in the recommended daily allowance of vitamin A between the
 ages of 4 and 6 years.

 Working

*Answer*: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mg

9. The graph shows the changes in oxygen concentration before and after waste whey was put into a river.

a) At which sample point was the oxygen concentration highest

 A, B, C or D? \_\_\_\_\_

b) Complete the sentence using one phrase from the box

 increases then stays the same increases and then decreases
 decreases and the stays the same decreases and then increases

**After waste whey is released into a river, the oxygen concentration \_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

10. A pupil measured the **voltage** produced by a solar cell at different **light intensities**.

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

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

b) What is the voltage produced when the light intensity is 80 units?
 \_\_\_\_\_mV

c) What light intensity gives a voltage of 14mV?
 \_\_\_\_\_ units

11. Scientists investigated the type of food eaten by two foxes, A and B.
 One fox lives in a town and the other lives in the countryside.
 The pie chart shows the results.



a) What percentage of the food eaten by Fox A is wild birds and mammals?

 \_\_\_\_\_\_\_%

b) Fox B eats 800 g of food in one day.
 How many grams of wild birds and mammals does it eat?

 Working

Answer: \_\_\_\_\_\_\_\_\_\_\_g

c) Which fox is more likely to be the one living in the town? Fox \_\_\_\_

 Give a reason for your answer.

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

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

12. The table and pie chart contain the same information about the diet of British people.



Animal protein is represented by which slice of the pie chart? \_\_\_\_\_

13 The table below shows the responses of a group of Scottish 15-year-olds when
 asked about their smoking habits.

 This information is presented in the pie chart.



Which slice of the pie chart represents the percentage of 15-year-olds who are regular smokers?

**14. Blood Groups**

There are four different blood groups called group A, group O, group B and group AB. For Japanese people, the most common blood group is A, with 38% having this type of blood. 30% of Japanese people have blood group O and 22% have blood group B. The remaining 10% have blood group AB.

1. Use this information to complete the table below.

|  |  |
| --- | --- |
| **Blood Group** | **Percentage of Japanese people (%)** |
|  |  |
|  |  |
|  |  |
|  |  |

**15. Smokers**

The percentage of adults who smoke is dropping in different parts of the United Kingdom. In the South of England, only 25% of people smoke, but in the North of England the percentage of people who smoke is 31%. In Scotland 32% of people smoke, while 27% of the people in Wales are smokers.

* Use the information above to complete this table:

|  |  |
| --- | --- |
| **Part of the United Kingdom** | **Percentage of people who smoke** |
|  |  |
|  |  |
|  |  |
|  |  |

**16. Energy**

Nearly all of the energy used in the world comes from burning fossil fuels. Coal provides 31% of the world’s energy. The second largest source of energy is oil which provides 26%. Another 19% of the world’s energy comes from natural gas. Renewable energy sources provide 20% of the world’s energy needs.

* Use the information above to complete this table:

|  |  |
| --- | --- |
| **Source of energy** | **Percentage of the world’s energy (%)** |
|  |  |
|  |  |
|  |  |
|  |  |

17. 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 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

18. 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

19. 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

20. 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

21. The table below shows the number of new plants growing on five spider plants
and five Mother of Thousands plants.



Which of the following shows the **average** number of new plants on each type of plant? (Tick the correct line)



22. The tables below show information about some fuels.



a) Complete the sentence:

 As the number of carbon atoms increases, the energy released \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

b) Name the fuel which releases 1560 kilojoules of energy.

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

**23.**

**Use the information in the passage to answer the questions.**Traditional windmills use the power of the wind to turn mill stones and
drive water pumps. Modern wind turbines also use the power of the wind.
However, a modern wind turbine turns a generator which produces
electricity.

The electricity produced by wind turbines goes into the National Grid. The National Grid then carries the electricity to homes and industries throughout Britain.

A 600 kW wind turbine can supply the electricity needed for 400 households. Although wind speeds are always changing, there is usually enough wind to operate the turbine for 70% of the time. A wind turbine is designed to last for about 20 years. However, moving parts such as blades and gearboxes must be regularly maintained to prevent the wind turbine from breaking down.

(*a*) What were traditional windmills used for?

|  |
| --- |
|  |

 (*b*) What happens to the electricity after it goes into the National Grid?

|  |
| --- |
|  |

(*c*) How many households can a 600 kW wind turbine supply?

|  |
| --- |
|  |

 (*d*) Name **two** parts of a wind turbine that must be regularly maintained.

|  |
| --- |
| 1.2. |

**24.**

**Use the information in the passage to answer the questions.**

Bees, wasps and termites are social insects. They live in family groups or colonies, and often build large nests. The number of insects in a colony can vary from a few hundred to several million.

Bees use wax to build hexagonal cells in their nests. Wasps build their nests from wood fibres, which they chew to produce a paper-like substance. Termites build large earth mounds which can be up to 6 metres high.

The insects in a colony differ in size and carry out different tasks. The smallest insects are called workers. Workers collect food, look after the young and repair the nest but are unable to reproduce. Larger insects, called soldiers, defend the nest from predators. Only one insect, called the queen, can reproduce. She is much bigger than the other members of the colony and may live for many years. A queen termite can lay up to 30 000 eggs a day and can live for 50 years, which is longer than any other insect.

(*a*) Name **three** types of social insects.

|  |
| --- |
|  |

(*b*) Which type of insect uses wood fibres to build its nest?

|  |
| --- |
|  |

(*c*) List **all** the tasks carried out by worker insects.

|  |
| --- |
|  |

(*d*) Describe **two** ways in which the queen is different from the other insects in a colony.

|  |
| --- |
| 1.2. |