**Science Skills**

**Reading Pie Charts**

**Levels 3 and 4**

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

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

**Pie Charts Levels 3 and 4**

Pie charts are used to display information comparing **quantities** of things.
They are especially useful to show **percentages** and for showing **proportion**.

**1.** **Working out percentages from looking at a pie chart**

*Example*

The pie chart below shows the percentage of S2 pupils’ choice in Science.(80 pupils)
a) What **percentage** chose biology?
b) What **percentage** chose chemistry?

When you look at the pie chart, you can see that **half** of the pupils chose biology, because half of the pie is blue, and blue represents biology in the **key**.

**Percentages are numbers out of a hundred**. The symbol for percentages is **%**
Half of a hundred is 50.
So the **percentage** who chose biology is **50%**

You can see that a quarter of the pupils chose chemistry.
A **quarter** of a hundred is 25.
So the percentage who chose chemistry is **25%.**

 **2. Converting percentages to actual numbers**
In the question you were told that there were **80** S2 pupils.

* 50% is the same as a half. To calculate a half (½), divide by 2.
**80÷2 = 40**
So **40 pupils** chose biology.
* 25% is the same as a quarter. To calculate a quarter (¼), divide by 4.
**80÷4 = 20**
So **20 pupils** chose chemistry.

**3.** **Less obvious percentages**

The pie chart below has been divided into 20 segments or ‘slices’. Check this.

Since this is a **percentage** pie chart, the **total number** represented by the chart has to be **100**.
So each segment must represent **5%.** (100 ÷ 20 = 5)



Example:

 **25%** of the children prefer apples.
 **5** of the segments are shaded to show this.

 **10%** of the children prefer bananas.
 **2** of the segments are shaded to show this.

4. **Calculating ratios**

**‘Ratio’ is used to compare different quantities**.

The **ratio** of spiders to wasps is **7 spiders to 3 wasps**.
The symbol for ratio is **:**
So the ratio of *spiders* to *wasps* is 7:3

***Example***
In a restaurant 30% of the customers ordered pizza, 20% ordered pasta, 10% ordered fish and chips 15% ordered steak and chips and 25% ordered curry.

**What is the ratio of pizza to fish and chips?**

1. Find the figures for pizza and fish/chips.

2. Write them with the ratio sign between
 them.
 30 : 10
 pizza : fish/chips

3. Ratios should normally have the number **1** on one of the sides, so the ratio has to
 be simplified. To do this, you divide **both sides** of the ratio by the **smallest number.** When you do this, one of the answers will always be **1.** In this example the smallest number is **10. 30÷10=3 10÷10=1**

So the **ratio** of pizza to fish and chipsis **3:1**

1 In a survey, pupils were asked how often they exercise.
 The results are shown in the pie chart.



a) What percentage of pupils exercise every day? \_\_\_\_\_\_\_\_\_\_%

b) There were 60 pupils in the survey. How many pupils exercise twice a week?

 *Working*

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

2 Joanne counted the number of different birds which visited her bird table in one hour.
 Her results are shown in the pie chart.



a) What percentage of birds were blue tits? \_\_\_\_\_\_\_\_\_\_\_ %

b) 40 birds visited the bird table. How many were siskins?

 *Working*

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

3 In a survey, pupils were asked how many fillings they had in their teeth.
 The results are shown in the pie chart.

a) What **percentage** of the pupils had one
 filling?
 \_\_\_\_\_\_\_\_ %

b) There were **80 pupils** in the survey. How many **pupils** had no fillings in their teeth?

 Working

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

4. The pie charts show the main use of energy in the UK in 1960 and in 2000.



a) What was the largest use of energy in 2000? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

b) Which energy use decreased from 1960 to 2000? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5 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.

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

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6 The pie chart shows the proportions of injuries resulting from different sports
 recorded at a sports injury clinic.



a) Tick the correct statement below:

More people were injured playing squash than tennis.

More people were injured playing rugby than football.

Fewer people were injured playing squash than rugby.

Fewer people were injured playing football than tennis.

b) Which sport resulted in 15% of the total injuries? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c) The number of injuries from playing squash was 32.
 How many injuries resulted from playing rugby?

 Working

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

7 The table below shows the components which make up the body mass of an adult
 female.

Which of the pie charts presents this information correctly?



Answer: \_\_\_\_

8 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? \_\_\_\_\_

9 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?

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

10 The pie chart shows five sources of Vitamin C and the percentage that each source
 contributes to a healthy diet.



Use the information to complete the following table:

|  |  |
| --- | --- |
| *Source of Vitamin C* | *Percentage of Vitamin C contributed* |
| Soft drinks | 5 |
| Milk and dairy products | 5 |
|  | 30 |
|  | 50 |
| Other foods |  |

**End of Level 3**

**Level 4**

11 Oatmeal and wheatmeal are two cereal products.
 The pie chart gives information about the components found in **oatmeal.**



 **Oatmeal**

**Wheatmeal** contains less fibre and more protein than oatmeal
The proportions of all the other components are the same.

a) Use **all** the information above to complete the following table:



b) Calculate the mass of protein present in an 80g portion of **wheatmeal**.

 Working

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

12 The table shows the composition of loam soil.

 a) Present the information in the form of a pie chart.





b) Calculate the simple whole number ratio of minerals to organic matter in loam soil.

 Working

Answer: \_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_
 minerals organic matter

13 The eye colours of 160 school pupils are shown in the table below.

 a) Present the information in the form of a pie chart.





b) Calculate the simple whole number ratio of green eyes to blue eyes.

 Working

Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
 green eyes blue eyes