Statistics: Cafe Pie Charts

Aim:	**Success Criteria:**	**Resources:**
Interpret pie charts and use these to solve problems. I can read and interpret pie charts.	I can describe how data is presented in a pie chart. I can use fractions to answer questions about data presented in a pie chart. I can reason about data represented in pie charts.	**Lesson Pack**
	Key/New Words: Pie chart, sector, categorical data, proportional value, key, legend, fractions.	**Preparation:** Differentiated **At the Cafe Pie Charts Activity Sheets** – one per child **Extra Challenge Activity Sheet** – as required

Prior Learning: It will be helpful if children have experience of solving problems using information presented in charts and graphs.

Learning Sequence

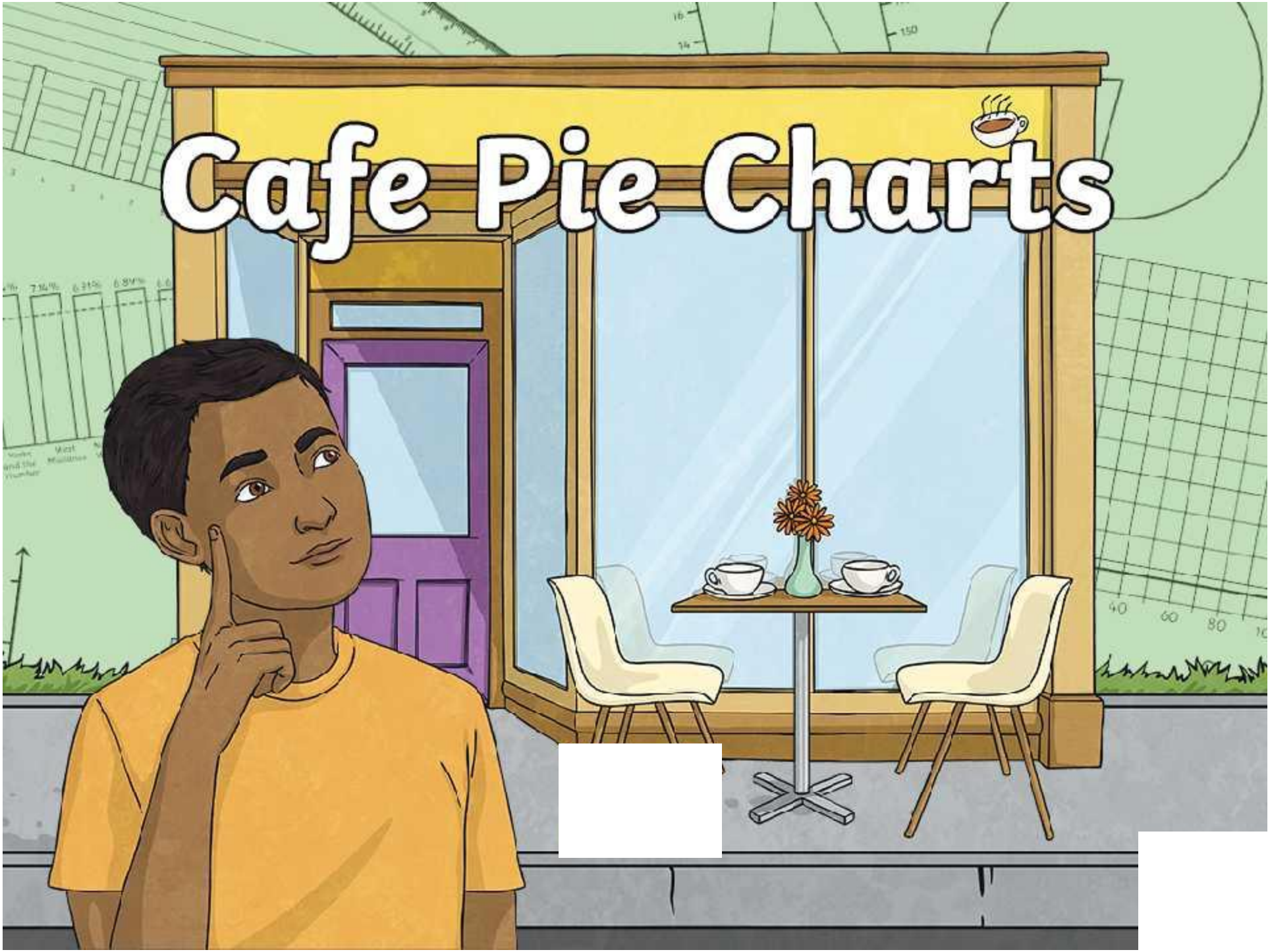
	Fractions of Shapes: Share the different shapes shown on the **Lesson Presentation**. Ask the children to consider what fraction of each shape has been shaded. Share and discuss the answers shown.	
	Cafe Pie Charts: Use the images and text shown on the **Lesson Presentation** to explain that pie charts are a good way of comparing the values of categorical data. Emphasise that the complete circle of a pie chart always represents the total value of all the categories, and that each sector shows the proportional value of each category. Draw attention to the use of a key or legend to explain what each sector relates to. Answer interpretation questions about the cafe pie charts.	
	Cafe Pie Chart Questions: Children work with a partner to answer the questions by interpreting the data represented in the pie chart shown on the **Lesson Presentation**. Go through the answers and address any misconceptions.	
	Cafe Customers Pie Charts: Use the images and text shown on the **Lesson Presentation** to demonstrate how to calculate the sector values of a pie chart when the total is unknown, using children's knowledge of fractions.	
	Cafe Customers Pie Chart Questions: Children work with a partner to answer the questions by interpreting the data represented in the pie chart shown on the **Lesson Presentation**. Share and discuss the answers.	
	At the Cafe Pie Charts: Children complete the differentiated **At the Cafe Pie Charts Activity Sheets**, to show they can read and interpret pie charts. Calculate the pie chart sector values using simpler calculations. Calculate the pie chart sector values. Calculate the pie chart sector values using more complex calculations. An **Extra Challenge Activity Sheet** is included as an extension activity if needed.	
	Pie Chart Reasoning: Share the pie chart shown on the **Lesson Presentation** that represents data about customers' choices of meals. Children work out the total number of customers asked, using the data they have been given, and explain their reasoning to their partners. Share the answer and reasoning as shown on the **Lesson Presentation**.	

Exploreit
Interpretit: Use these to check on children's understanding of how to interpret pie charts.
Organiseit: This is a really handy resource to reinforce ways to interpret pie charts.

Maths

Statistics

Regent Studies | www.regentstudies.com


Cafe Pie Charts

Aim

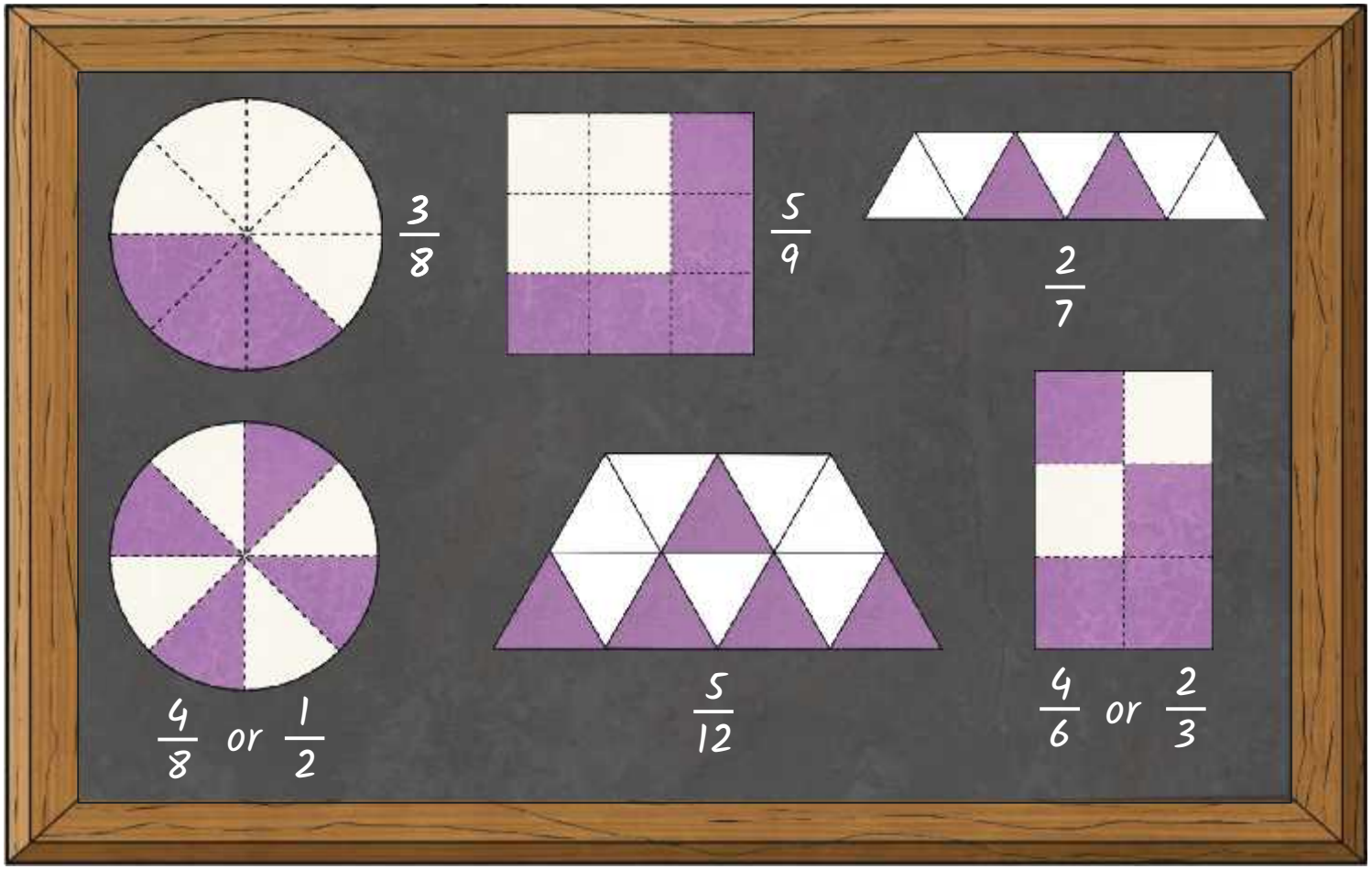
I can read and interpret pie charts.

Success Criteria

- I can describe how data is presented in a pie chart.
- I can use fractions to answer questions about data presented in a pie chart.
- I can reason about data represented in pie charts.

Fractions of Shapes

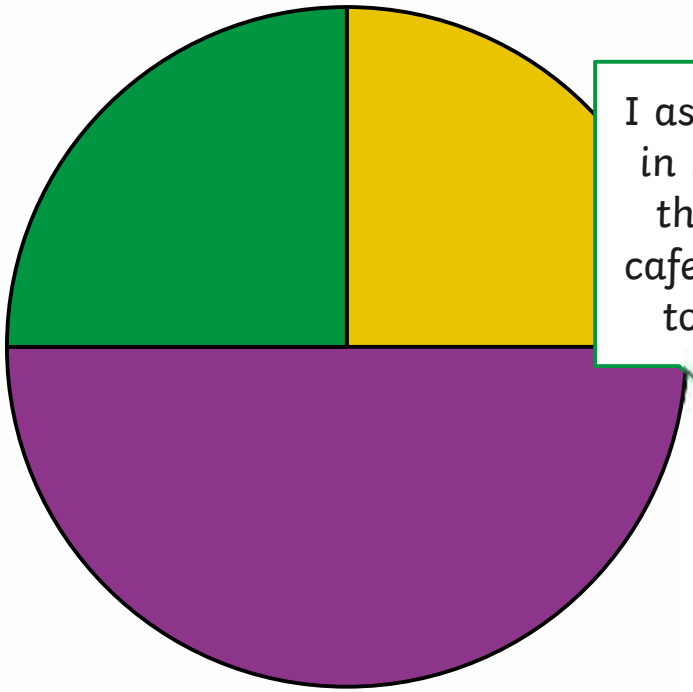
What fraction of each shape has been shaded?



Cafe Pie Charts

A pie chart is a good way of comparing the values of categorical data.

Categorical data is data that consists of two or more categories that cannot be ordered. For example, hair colour is a categorical variable as there are two or more categories (blonde, brown, black, red, etc.) and there is no way to order these from highest to lowest.

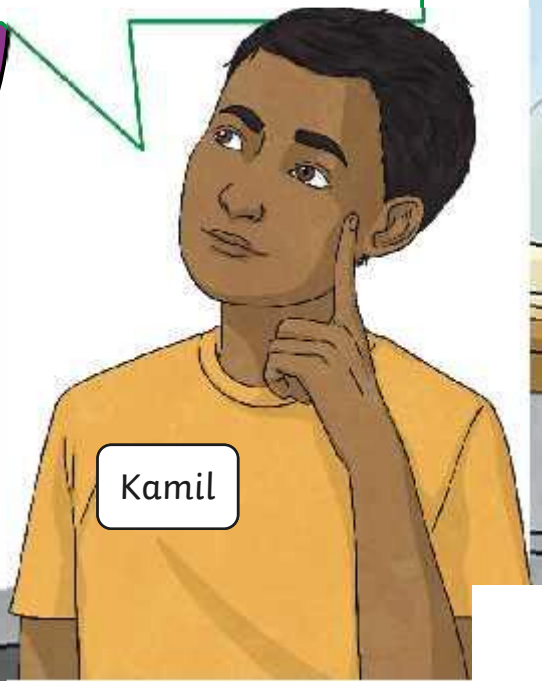


Every day

Once a week

Never

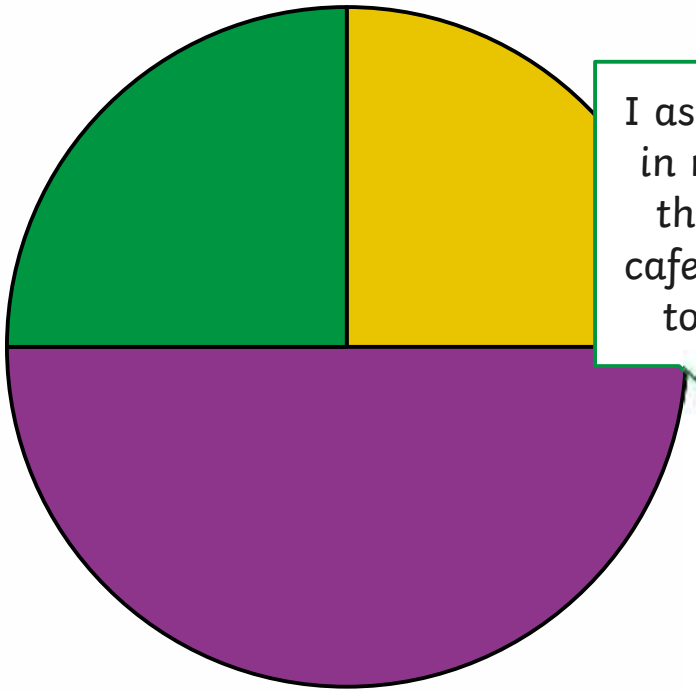
I asked twenty children in my class how often they eat at the local cafe. Here is a pie chart to show the results.



Kamil

Cafe Pie Charts

A pie chart is a good way of comparing the values of categorical data.

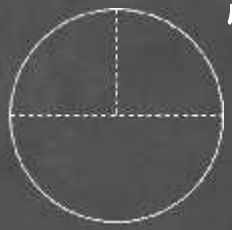


I asked twenty children in my class how often they eat at the local cafe. Here is a pie chart to show the results.

Kamil

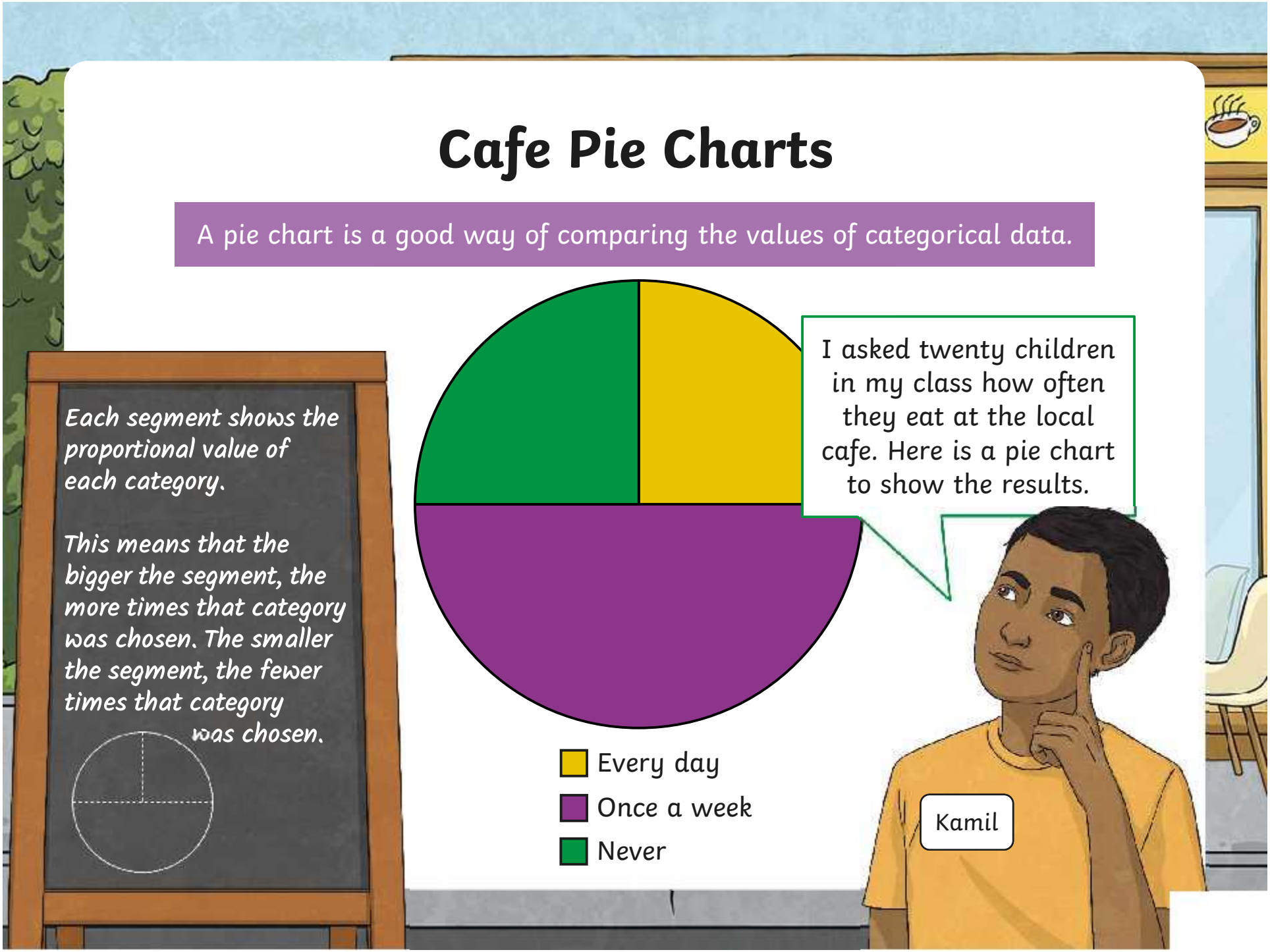
The complete circle of a pie chart always represents the total value of all the categories.

These are the only categories the children could choose from, so every answer given is represented in the full circle.



Cafe Pie Charts

A pie chart is a good way of comparing the values of categorical data.



Cafe Pie Charts

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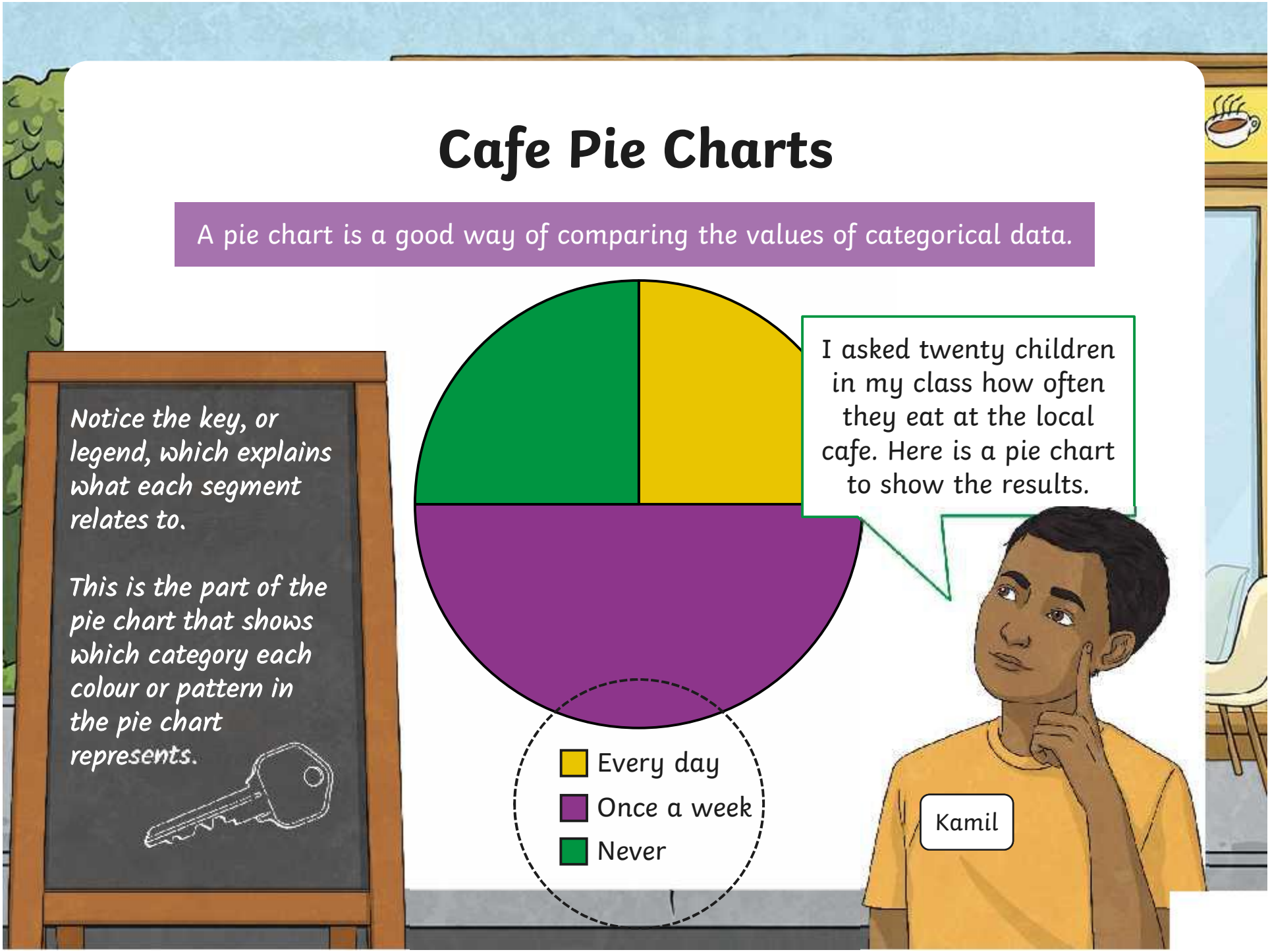


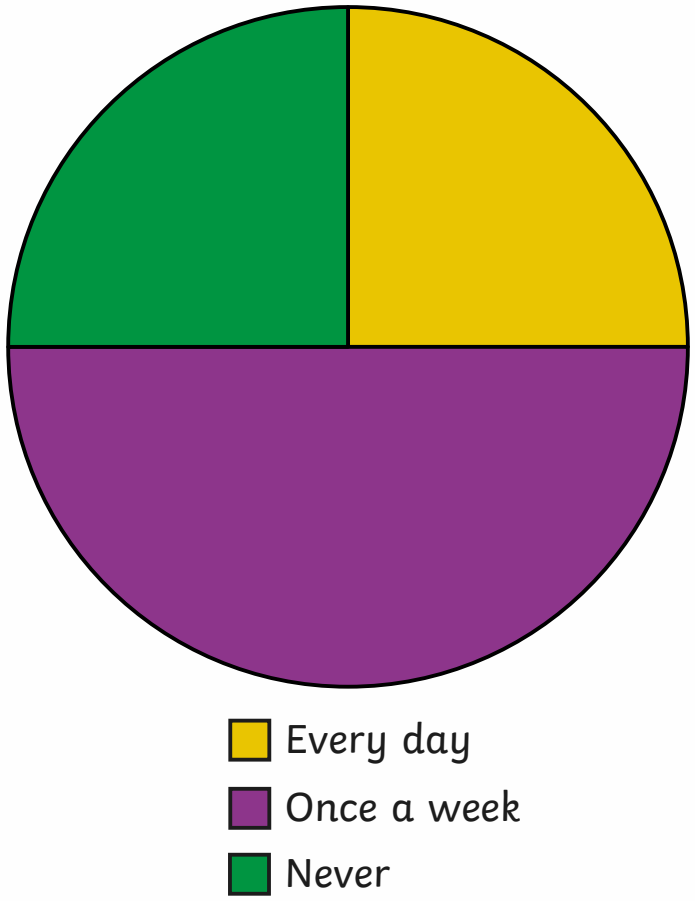
Cafe Pie Charts

We can use our understanding of **fractions** to help us find out the value of each segment.

In this pie chart, we know that **20 children** were asked how often they eat at the local cafe.

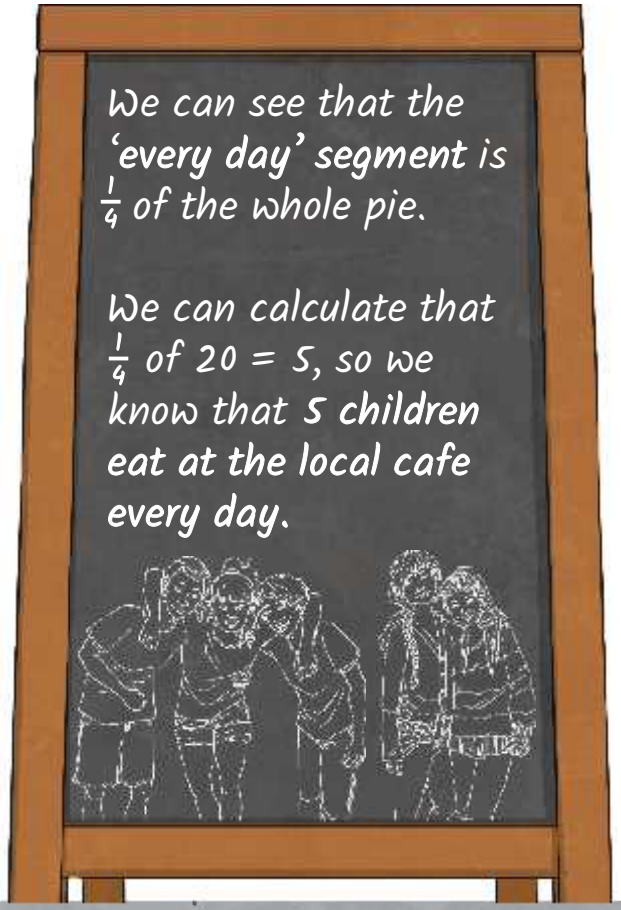
We can see that the **'once a week' segment** is $\frac{1}{2}$ of the whole pie.

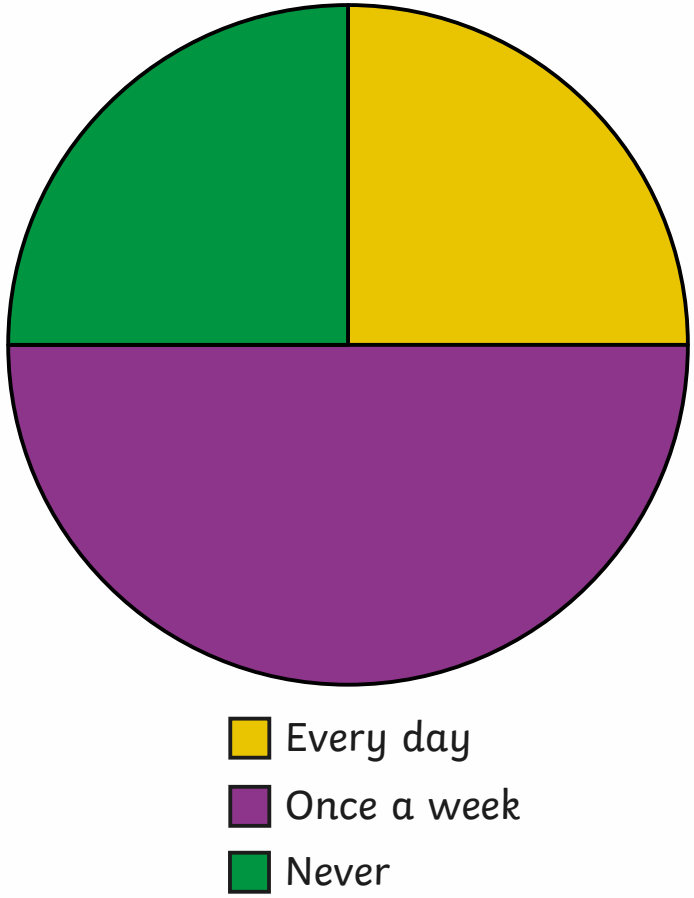
We can calculate that $\frac{1}{2}$ of 20 = 10, so we know that **10 children eat at the local cafe once a week.**



Cafe Pie Charts

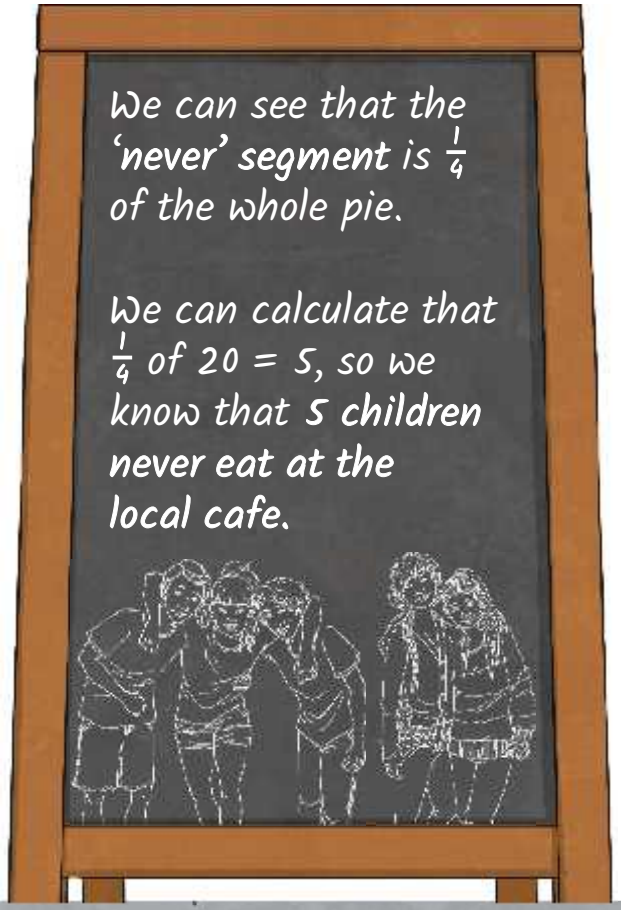
We can use our understanding of **fractions** to help us find out the value of each segment.

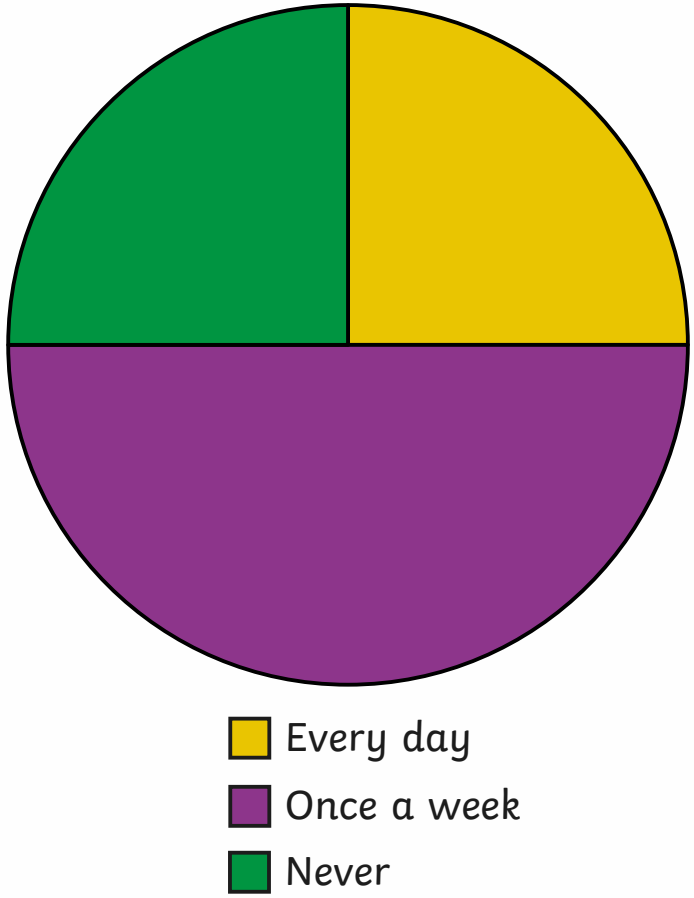




Cafe Pie Charts

We can use our understanding of **fractions** to help us find out the value of each segment.





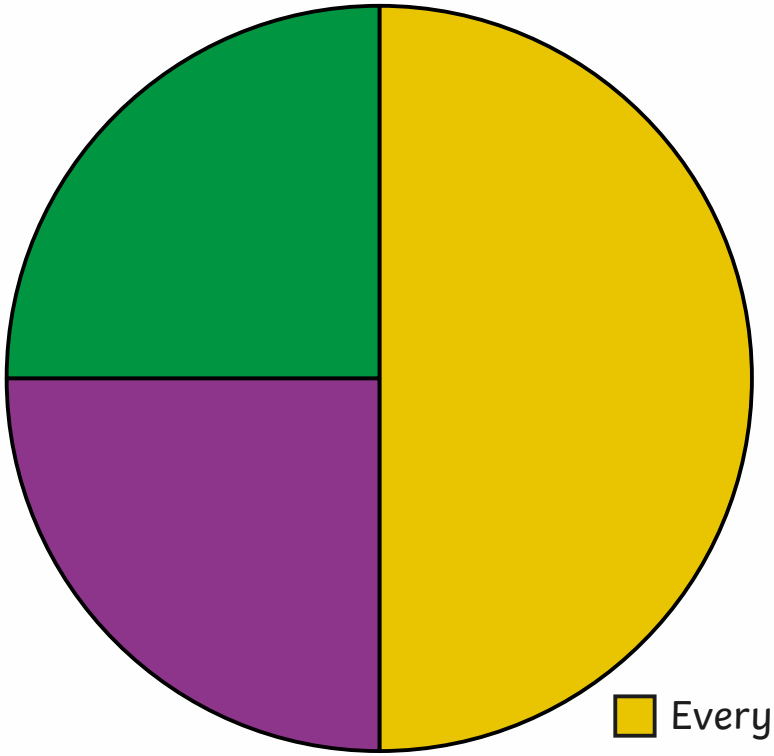
Cafe Pie Charts Questions

Use your understanding of fractions to answer questions about these pie charts:

I asked 24 children in my sister's class how

$\frac{1}{4}$ of 24 = 6
so 6 children never eat at the cafe.

Kamil



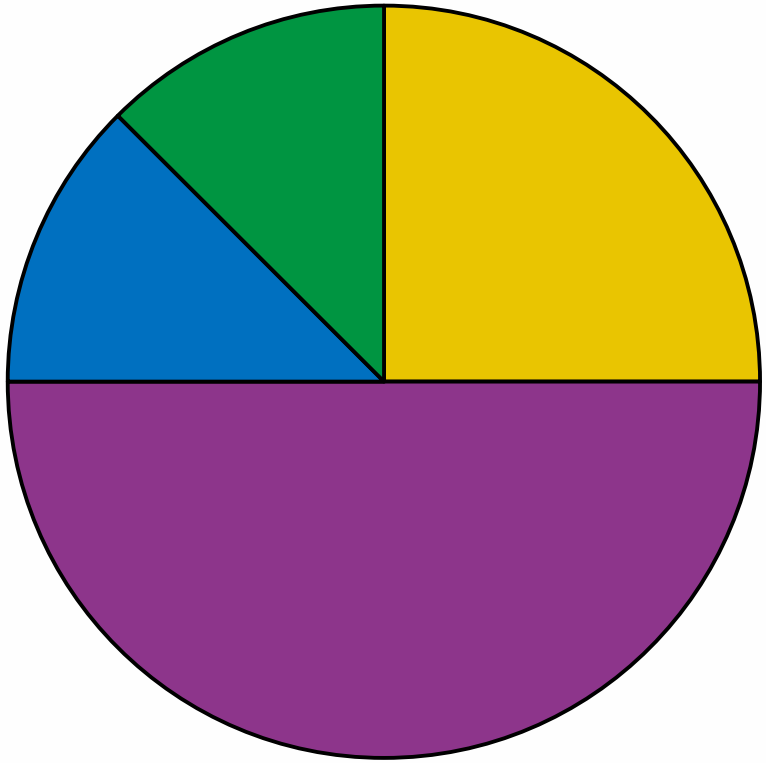
Cafe Pie Charts Questions

Use your understanding of fractions to answer questions about these pie charts:

I asked 40 children in
hey
afe.
ered
?

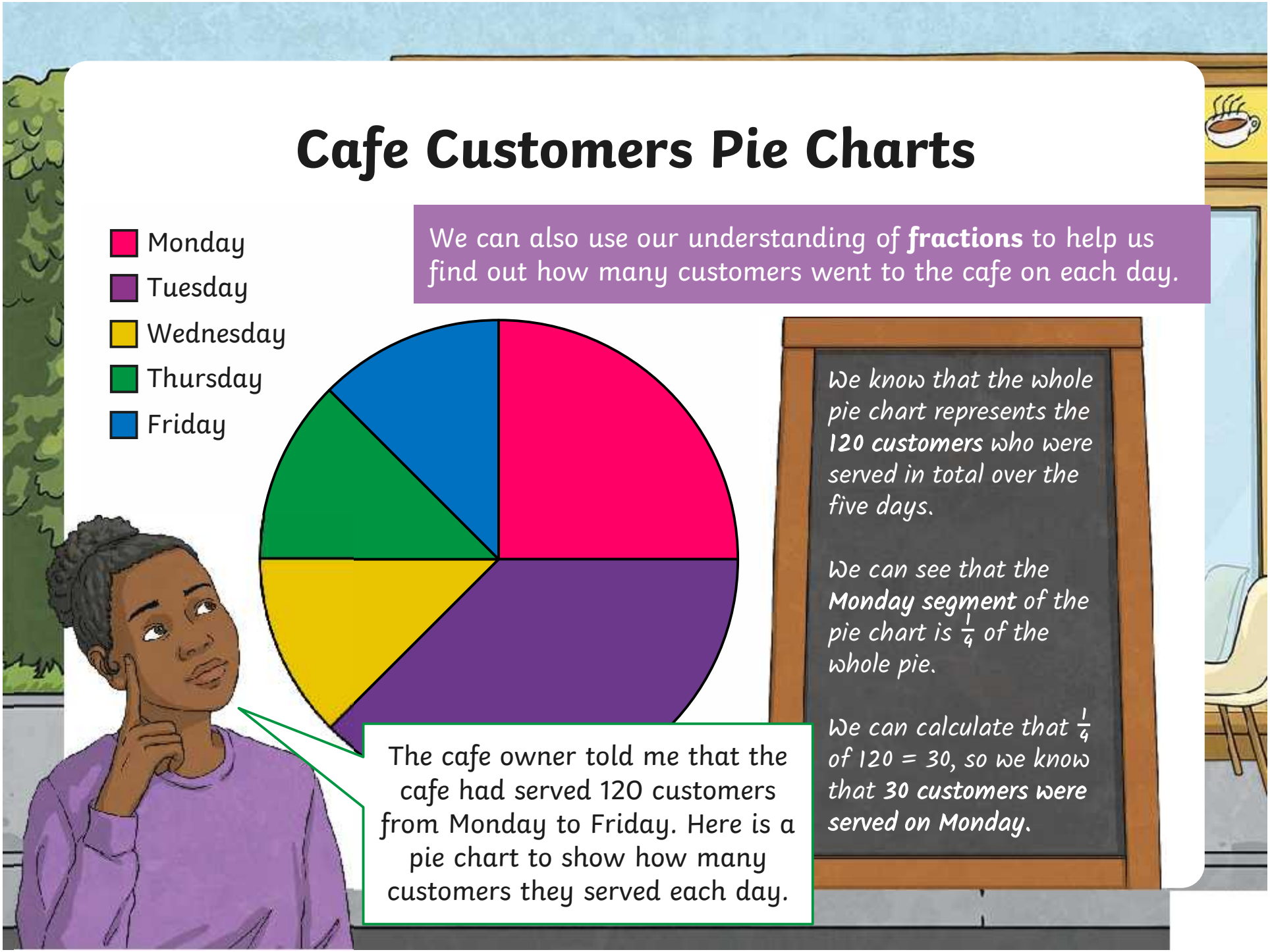
$\frac{1}{8}$ of 40 = 5
so 5 children
eat at the cafe
once a month.

Kamil



Every day | Once a week | Never | Once a month

Cafe Customers Pie Charts

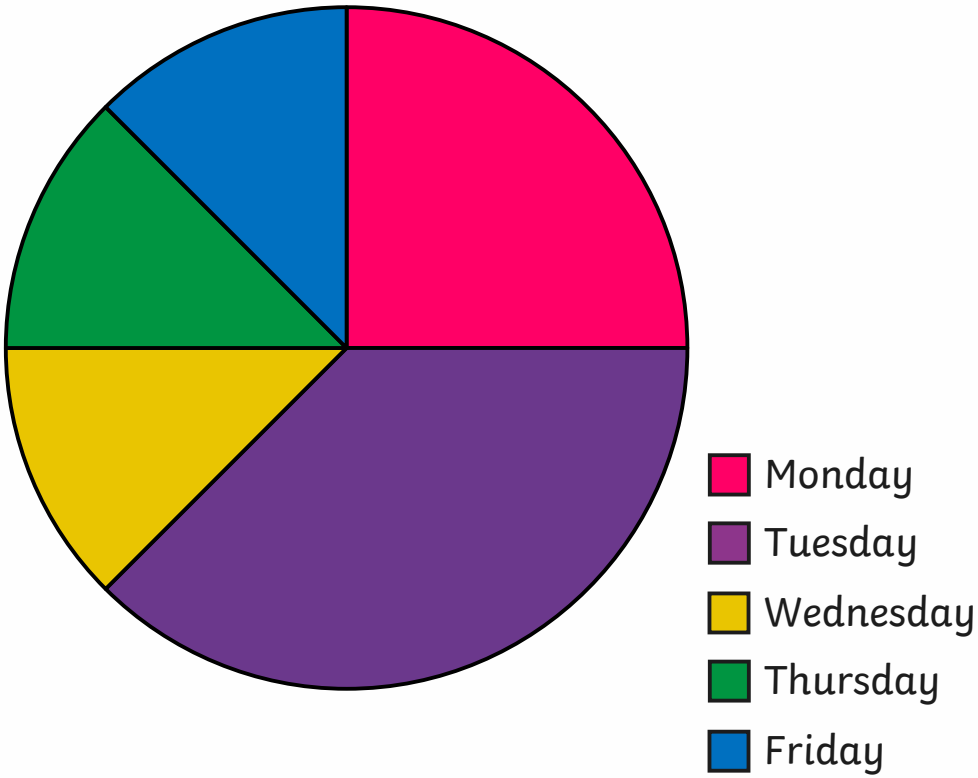


Cafe Customers Pie Charts

We can also use our understanding of **fractions** to help us find out how many customers went to the cafe on each day.

We can see that the **Wednesday, Thursday and Friday segments** of the pie chart are $\frac{1}{8}$ of the whole pie each.

We can calculate that $\frac{1}{8}$ of 120 = 15, so we know that **15 customers were served each day on Wednesday, Thursday and Friday.**

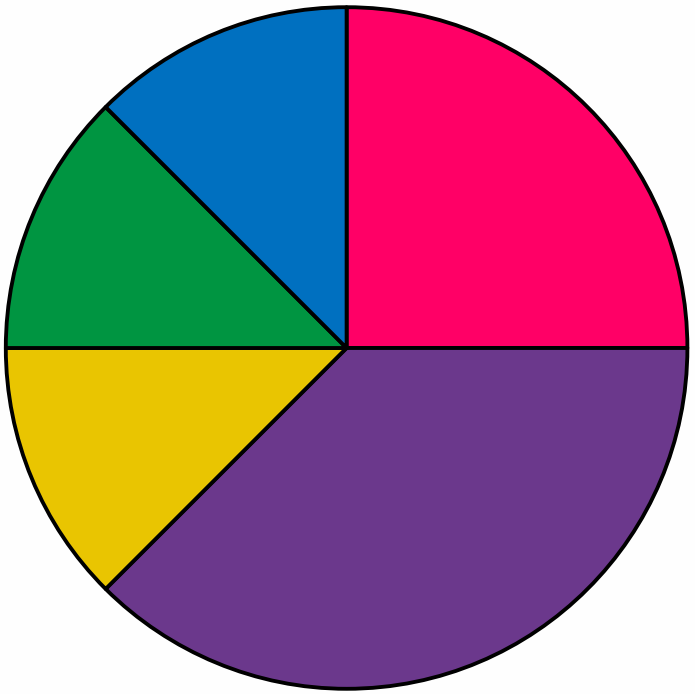


Cafe Customers Pie Charts

We can also use our understanding of **fractions** to help us find out how many customers went to the cafe on each day.

We can see that the **Tuesday segment** of the pie chart is $\frac{3}{8}$ of the whole pie.

We can calculate that $\frac{3}{8}$ of 120 = 45, so we know that **45 customers were served on Tuesday.**



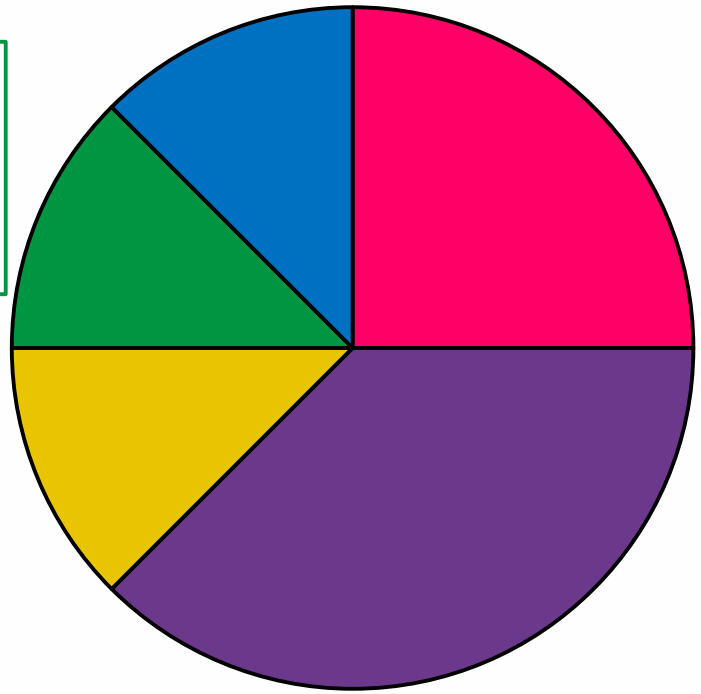
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

Cafe Customers Pie Charts Questions

Use your understanding of fractions to answer questions about these pie charts:

The cafe served 160
M
Ho
se

$\frac{1}{8}$ of 160 = 20
so $\frac{3}{8}$ of 160 = 60
60 customers were served on Tuesday.



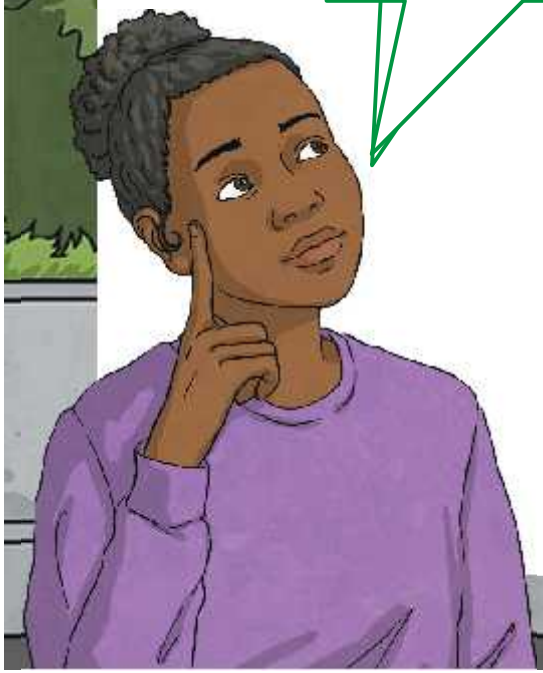
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

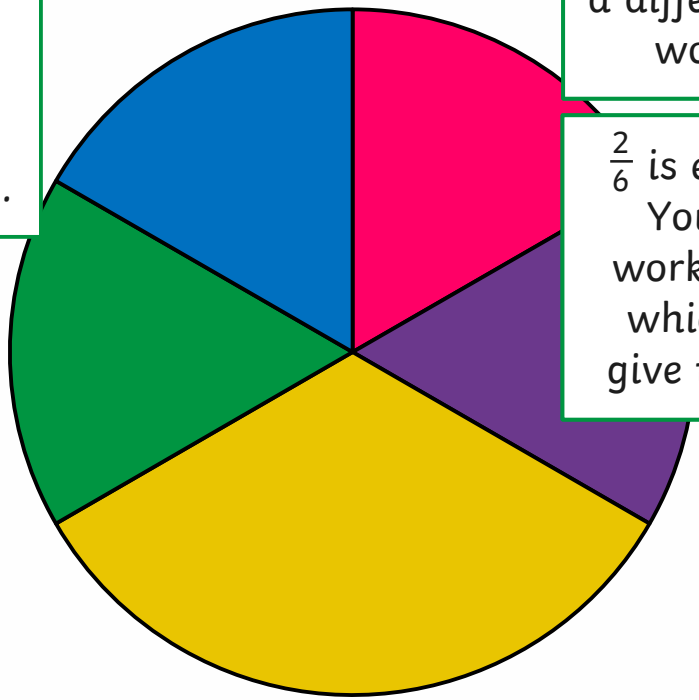
Cafe Customers Pie Charts Questions

Use your understanding of fractions to answer questions about these pie charts:

The cafe served 72

$\frac{1}{6}$ of 72 = 12
so $\frac{2}{6}$ of 72 = 24
24 customers were served on Wednesday.





Could you have used a different fraction to work this out?

$\frac{2}{6}$ is equivalent to $\frac{1}{3}$. You could have worked out $\frac{1}{3}$ of 72 which would still give the answer 24.

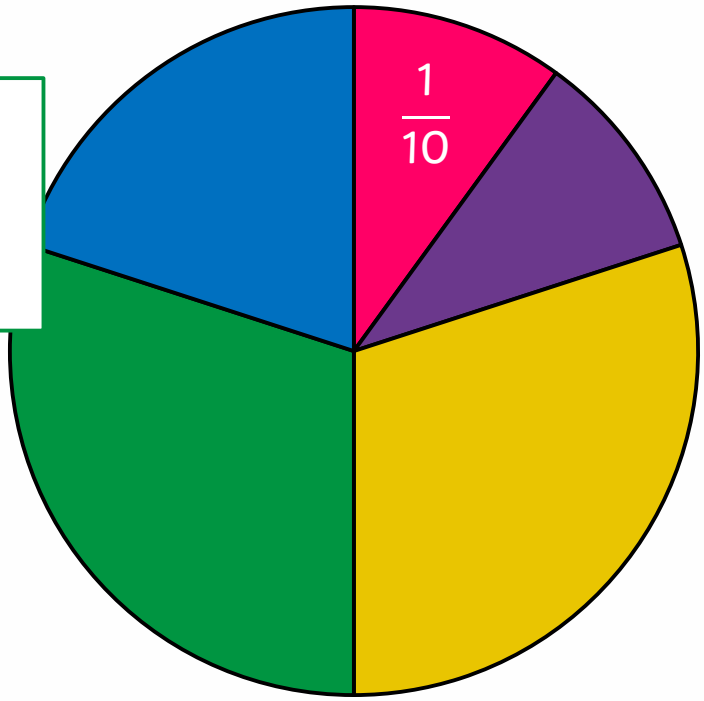
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday

Cafe Customers Pie Charts Questions

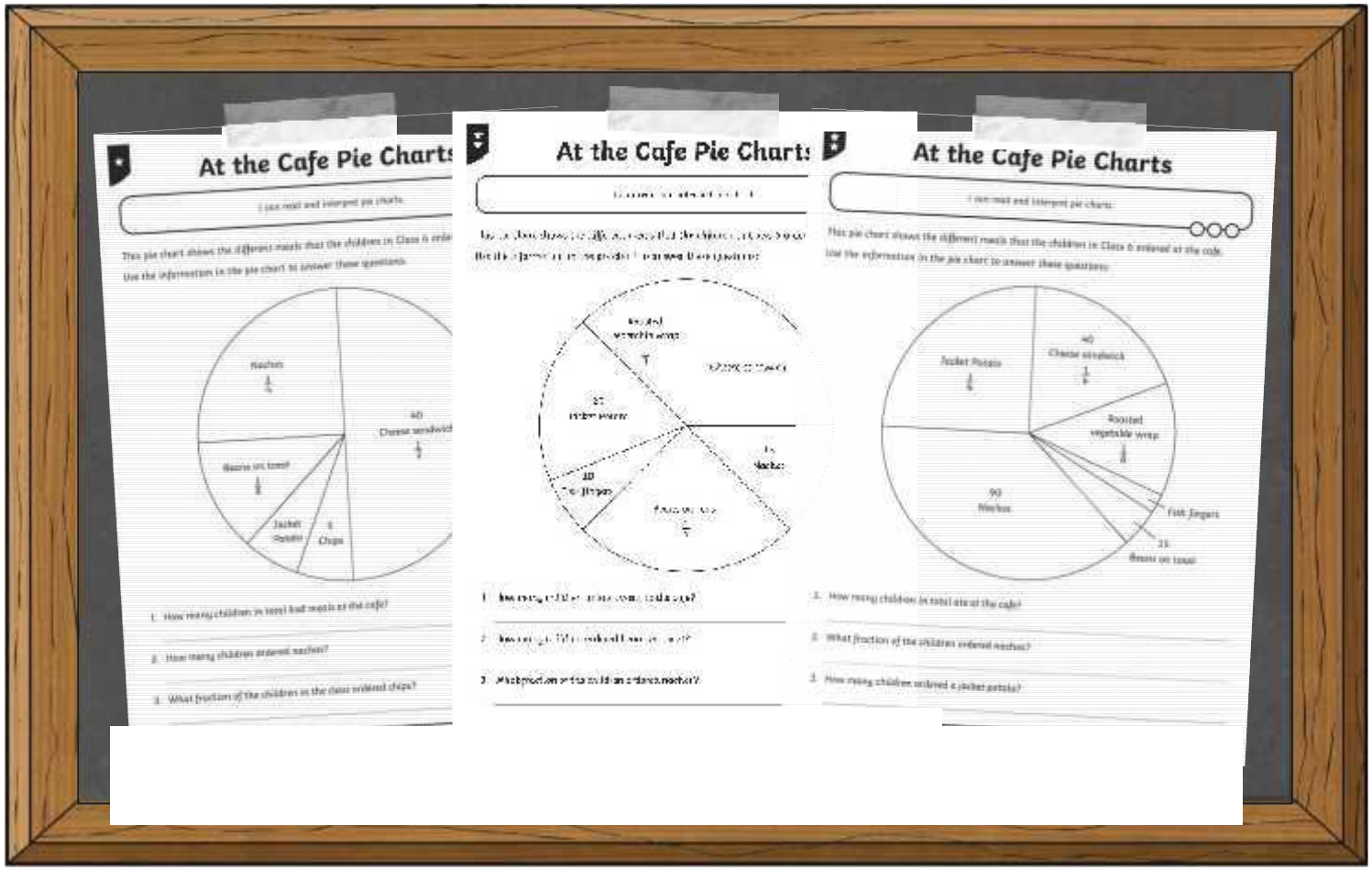
Use your understanding of fractions to answer questions about these pie charts:

The cafe served 250 customers from

$\frac{1}{10}$ of 250 = 25
so $\frac{3}{10}$ of 250 = 75
75 customers were served on Thursday.

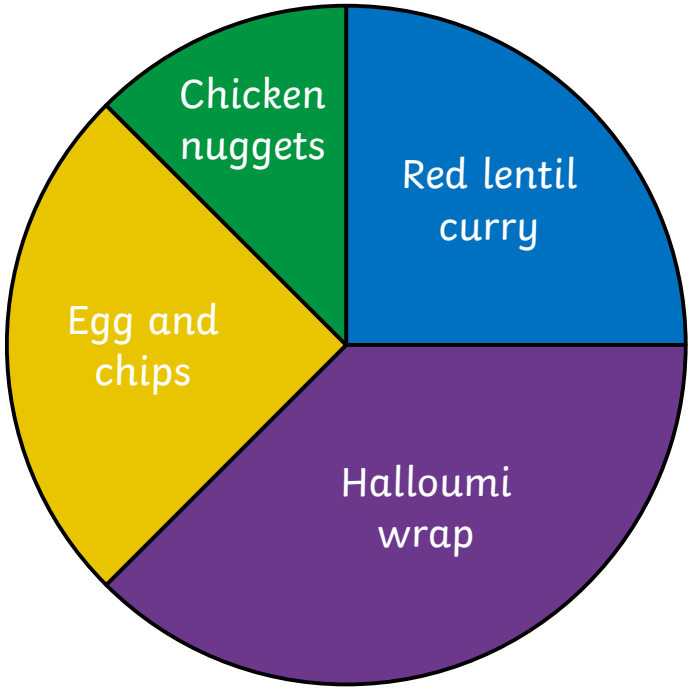


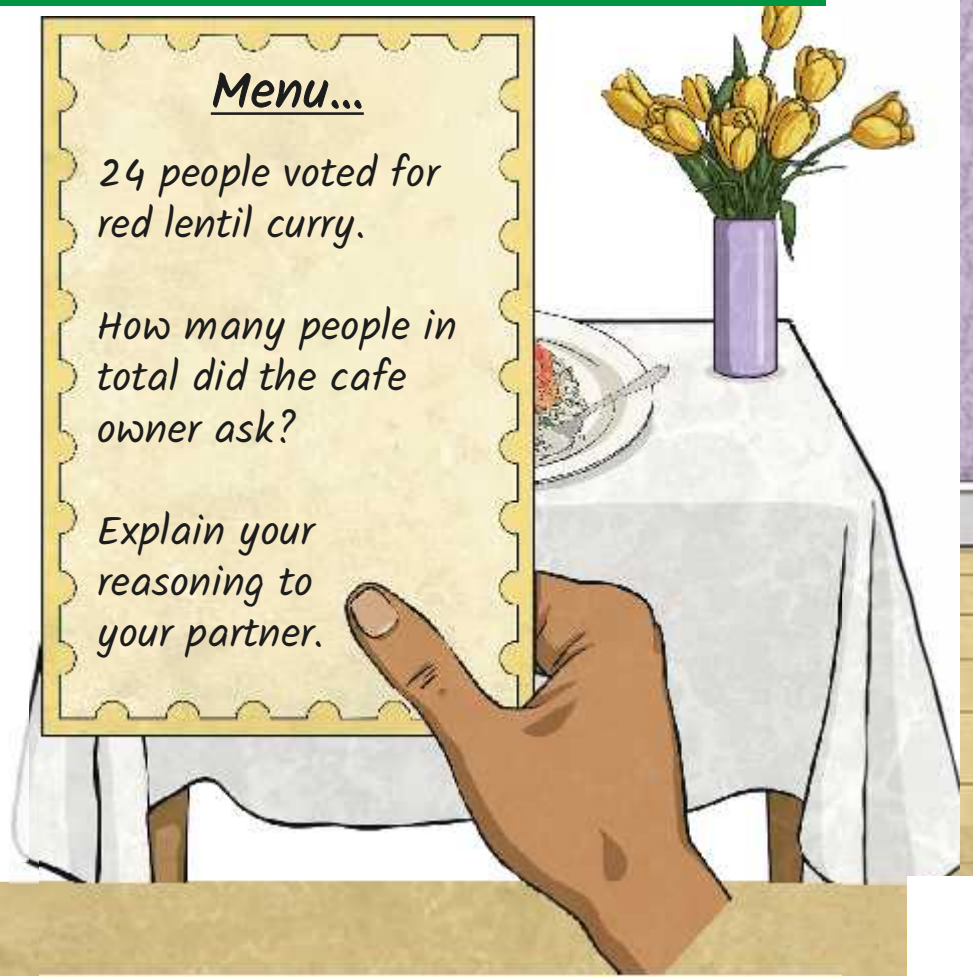
At the Cafe Pie Charts



Pie Chart Reasoning

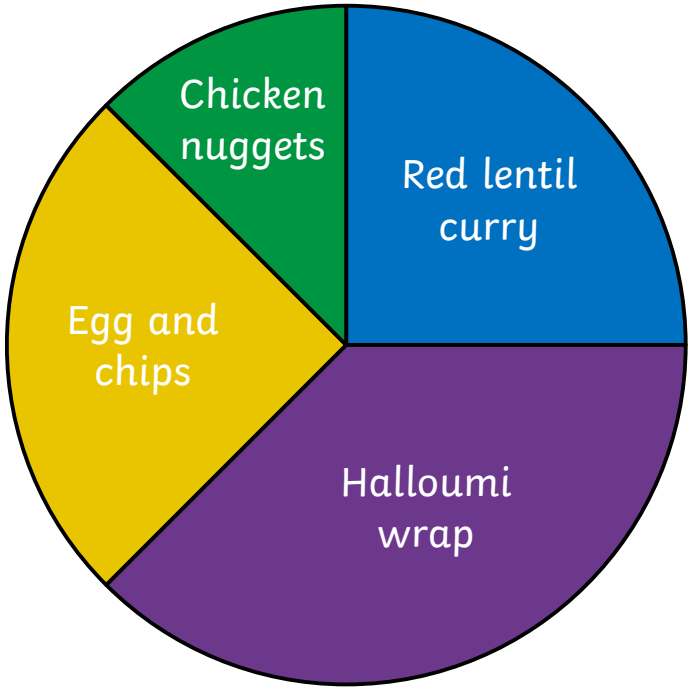
The cafe owner wants to add a new item to the lunch menu. She asks some of her customers which dish they would prefer. The results are shown in this pie chart.

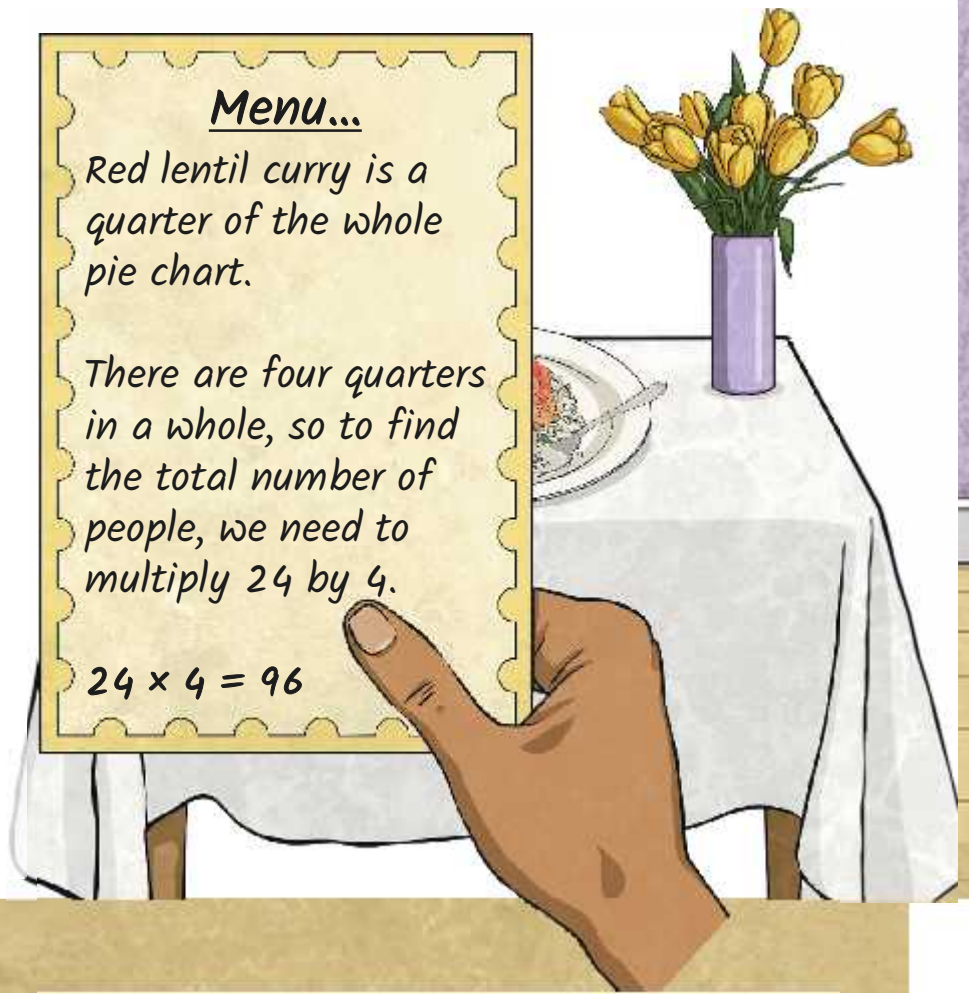




Pie Chart Reasoning

The cafe owner asked **96** people in total.



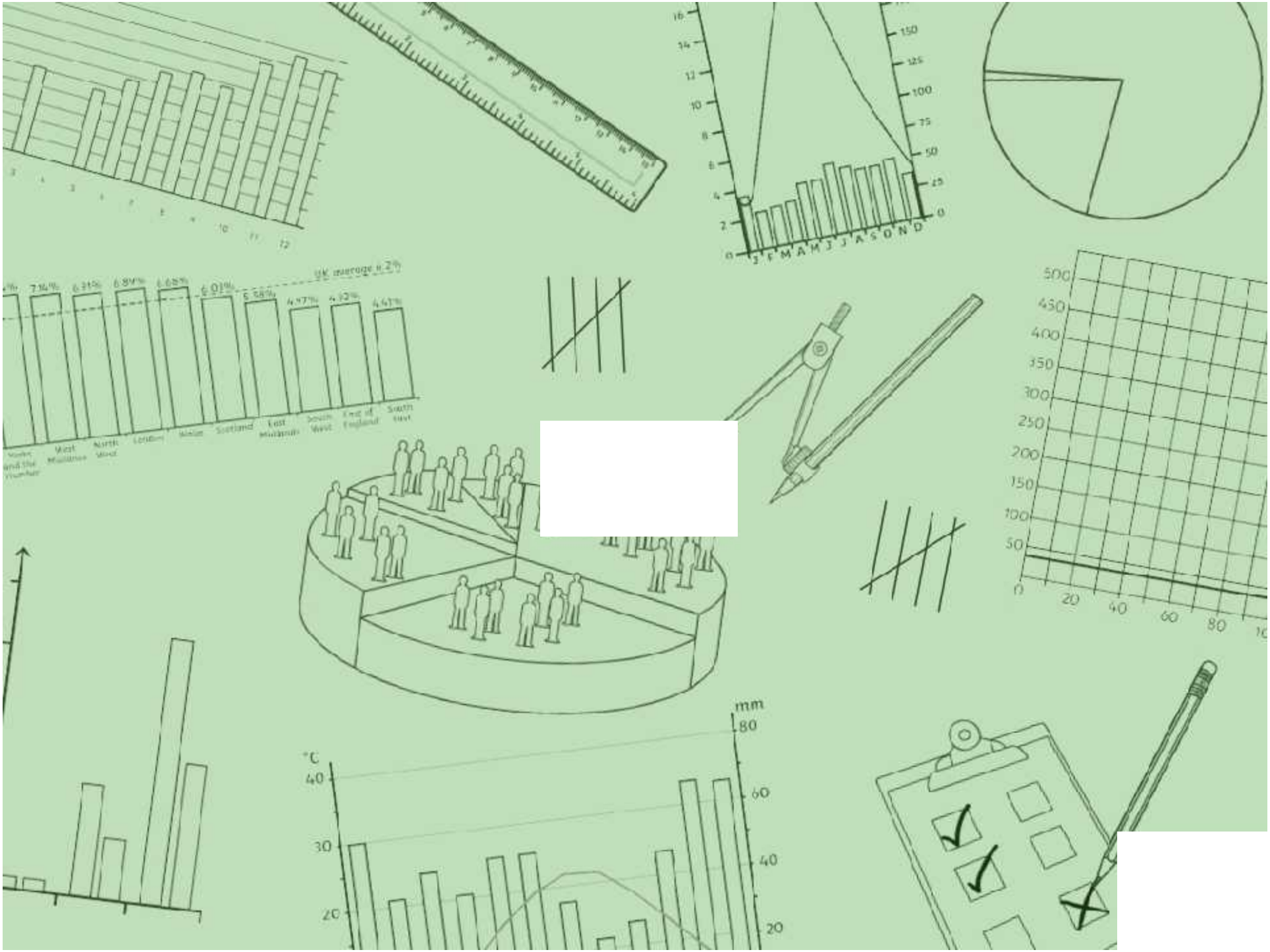


Aim

- I can read and interpret pie charts.

Success Criteria

- I can describe how data is presented in a pie chart.
- I can use fractions to answer questions about data presented in a pie chart.
- I can reason about data represented in pie charts.


J F M A M J J A S O N D
UK average 6.2%
mm
°C

Aim: I can read and interpret pie charts.				**Date:**					
				Delivered By:			**Support:**		
Success Criteria	**Me**	**Friend**	**Teacher**	**T**	**PPA**	**S**	**I**	**AL**	**GP**
I can describe how data is presented in a pie chart.				**Notes/Evidence**					
I can use fractions to answer questions about data presented in a pie chart.									
I can reason about data represented in pie charts.									
Next Steps) _____) _____									

T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

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Next Steps) _____) _____									

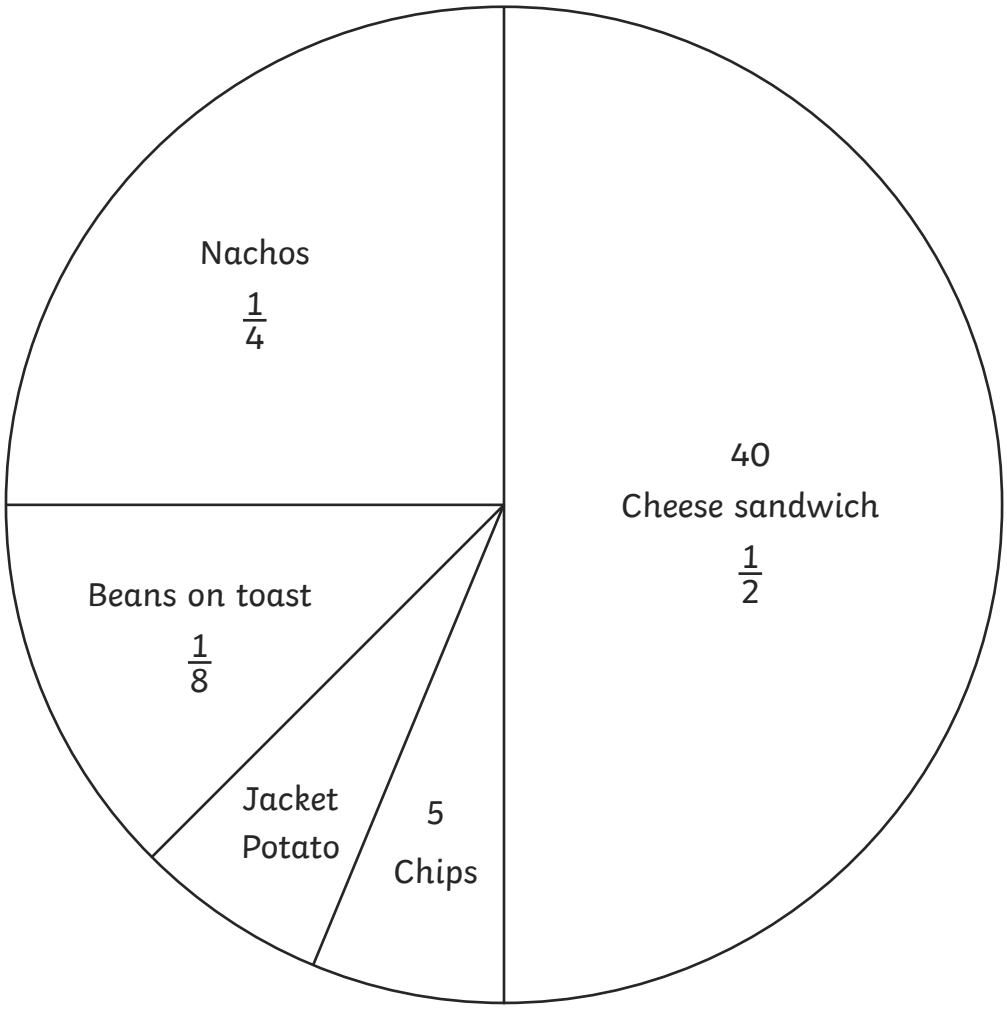
T	Teacher	**I**	Independent
PPA	Planning, Preparation and Assessment	**AL**	Adult Led
S	Supply	**GP**	Guided Practice

At the Cafe Pie Charts

I can read and interpret pie charts.

This pie chart shows the different meals that the children in Class 6 ordered at the cafe.

Use the information in the pie chart to answer these questions:



1. How many children in total had meals at the cafe?

_____

2. How many children ordered nachos?

_____

3. What fraction of the children in the class ordered chips?

_____

4. How many children ordered beans on toast?

5. What fraction of the children ordered a jacket potato or chips?

6. What fraction of the children ordered beans on toast or a cheese sandwich?

7. How many children ordered a jacket potato?

At the Cafe Pie Charts

I can read and interpret pie charts.

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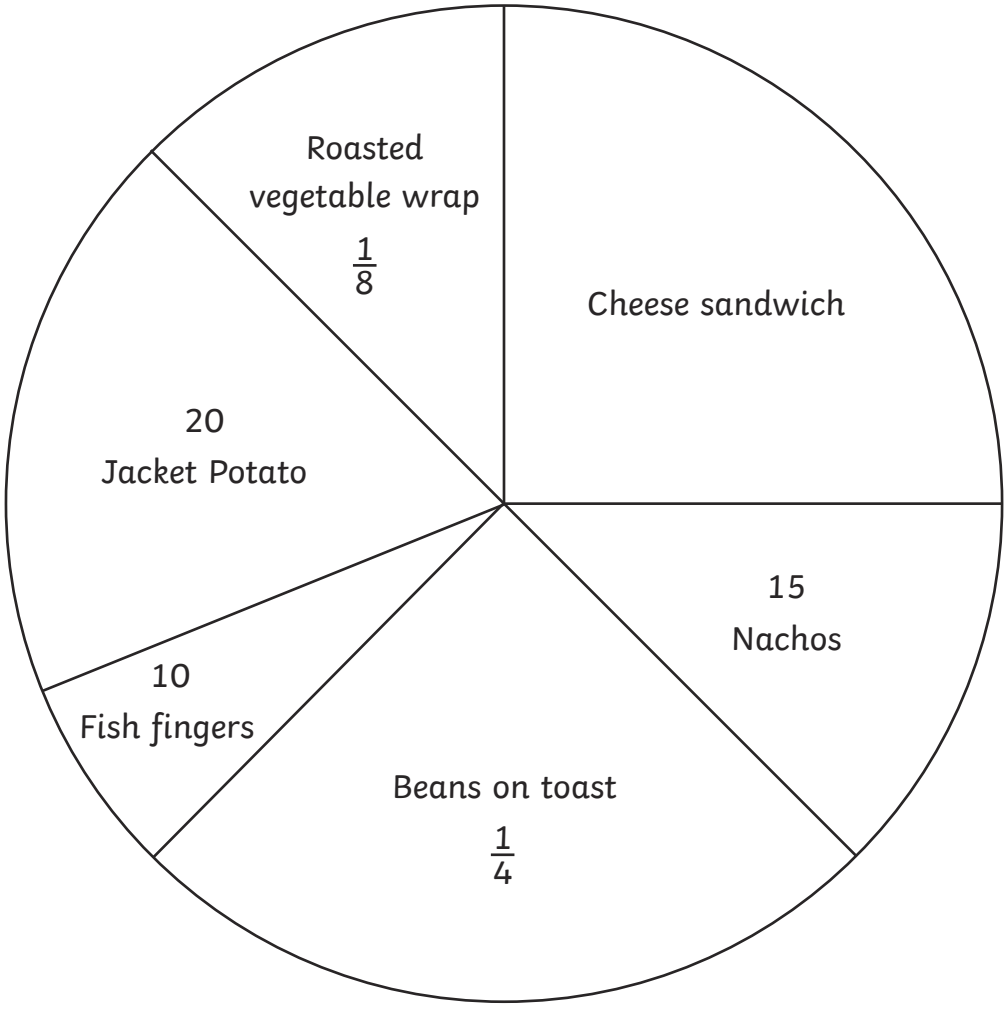
Use the information in the pie chart to answer these questions:



1. How many children in total went to the cafe?

_____

2. How many children ordered beans on toast?

_____

3. What fraction of the children ordered nachos?

_____

4. What fraction of the children ordered fish fingers?

5. How many children ordered a cheese sandwich?

6. How many children ordered the roasted vegetable wrap?

7. What fraction of the children ordered the jacket potato?

8. What combination of four menu choices accounts for exactly three quarters of the total orders?

At the Cafe Pie Charts

I can read and interpret pie charts.

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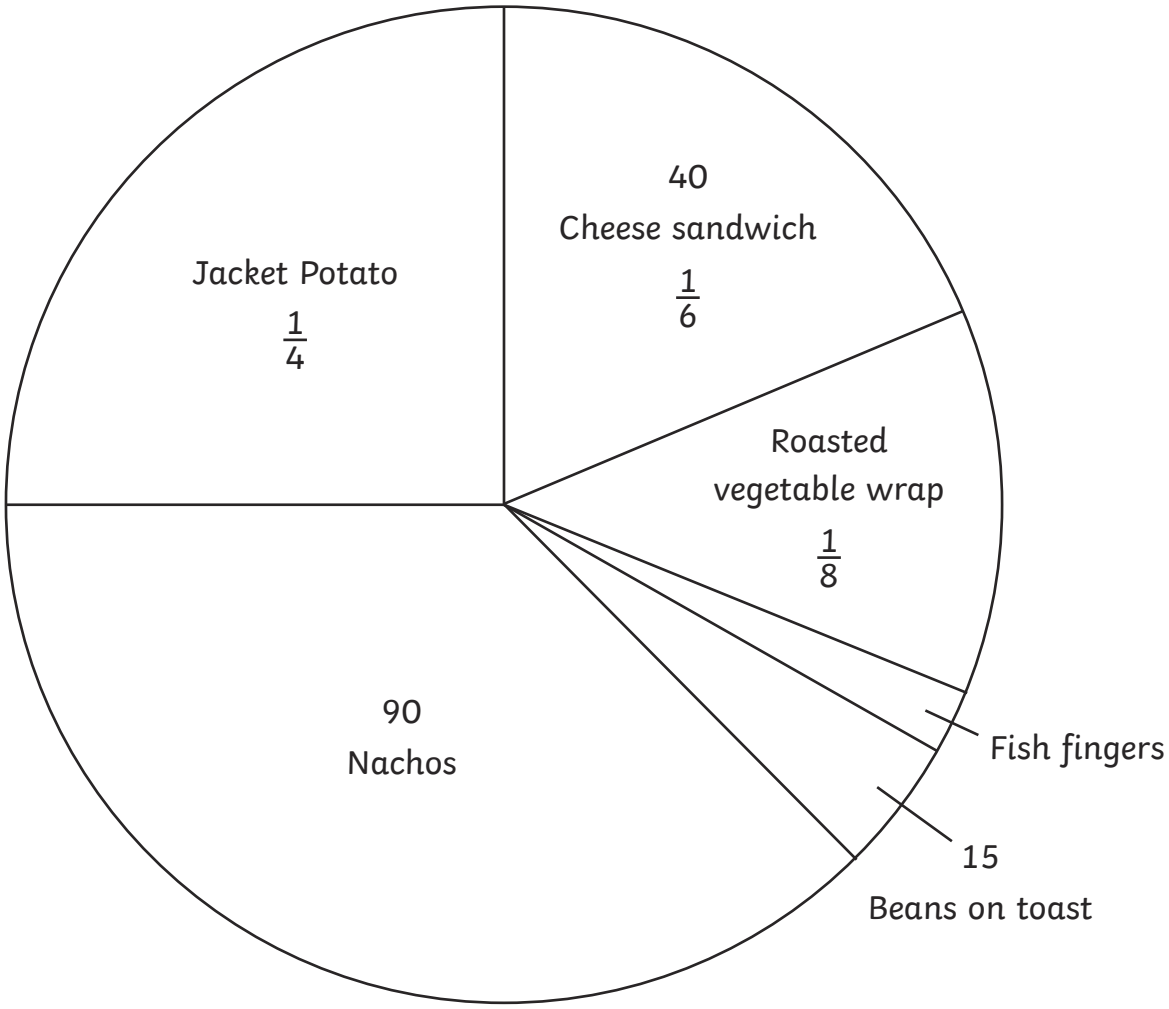
Use the information in the pie chart to answer these questions:



1. How many children in total ate at the cafe?

_____

2. What fraction of the children ordered nachos?

_____

3. How many children ordered a jacket potato?

_____

4. How many children ordered fish fingers?

5. What fraction of the children ordered beans on toast?

6. What combination of two menu choices accounts for exactly half of the total orders?

7. What fraction of the children ordered fish fingers?

8. How many children ordered the roasted vegetable wrap?

At the Cafe Pie Charts **Answers**

1. How many children in total had meals at the cafe?

   80

2. How many children ordered nachos?

   20

3. What fraction of the children in the class ordered chips?

   $\frac{1}{16}$

4. How many children ordered beans on toast?

   10

5. What fraction of the children ordered a jacket potato or chips?

   $\frac{1}{8}$

6. What fraction of the children ordered beans on toast or a cheese sandwich?

   $\frac{5}{8}$

7. How many children ordered a jacket potato?

   5

At the Cafe Pie Charts **Answers**

1. How many children in total went to the cafe?

   120

2. How many children ordered beans on toast?

   30

3. What fraction of the children ordered nachos?

   $\frac{1}{8}$

4. What fraction of the children ordered fish fingers?

   $\frac{10}{120}$ or $\frac{1}{12}$

5. How many children ordered a cheese sandwich?

   30

6. How many children ordered the roasted vegetable wrap?

   15

7. What fraction of the children ordered the jacket potato?

   $\frac{20}{120}$ or $\frac{2}{12}$ or $\frac{1}{6}$

8. What combination of four menu choices accounts for exactly three quarters of the total orders?

   Cheese sandwich, beans on toast, nachos and roasted vegetable wrap

At the Cafe Pie Charts **Answers**

1. How many children in total ate at the cafe?

   240

2. What fraction of the children ordered nachos?

   $\frac{3}{8}$

3. How many children ordered a jacket potato?

   60

4. How many children ordered fish fingers?

   5

5. What fraction of the children ordered beans on toast?

   $\frac{1}{16}$

6. What combination of two menu choices accounts for exactly half of the total orders?

   Nachos and roasted vegetable wrap

7. What fraction of the children ordered fish fingers?

   $\frac{5}{240}$ or $\frac{1}{48}$

8. How many children ordered the roasted vegetable wrap?

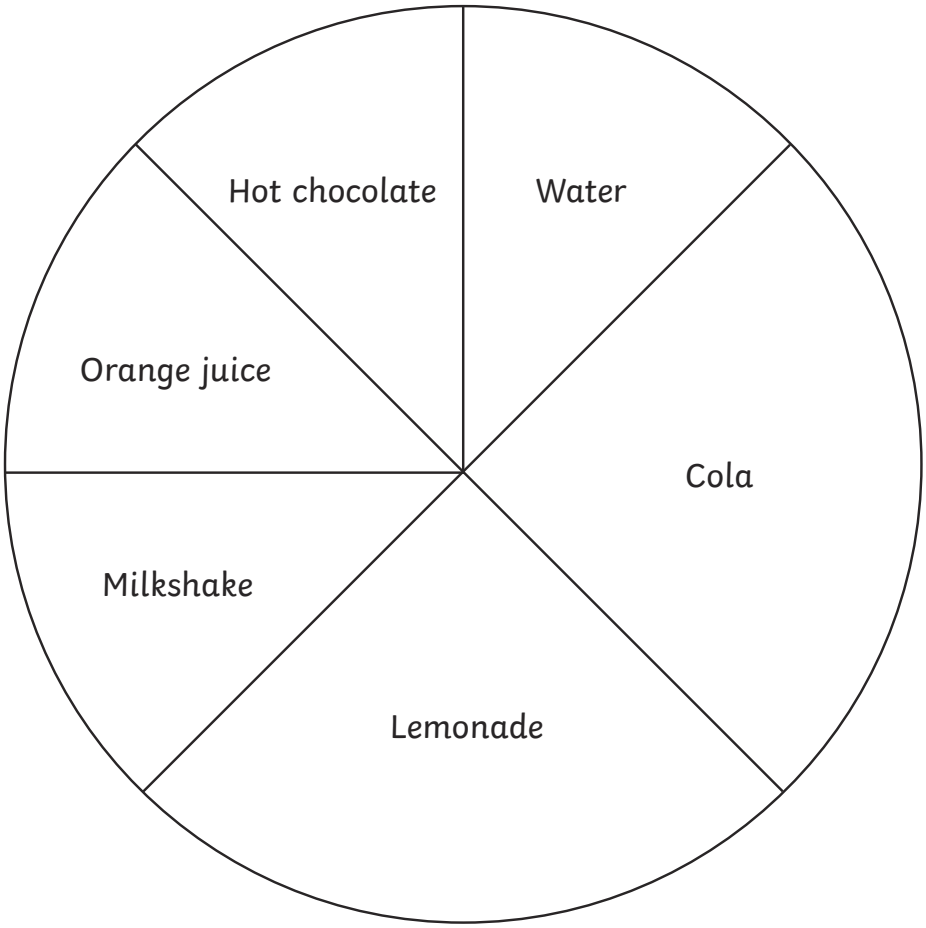
   30

At the Cafe Pie Charts

I can read and interpret pie charts.

This pie chart shows the different drinks that the children in Newtown Primary School ordered at the cafe. 15 children chose orange juice.

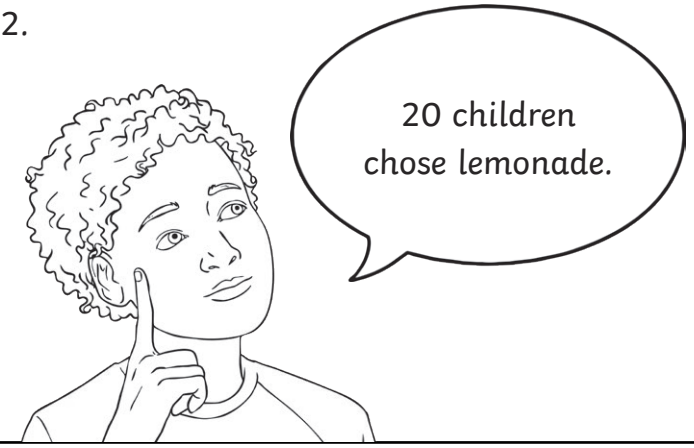
Three children are talking about what the different segments represent.



1.

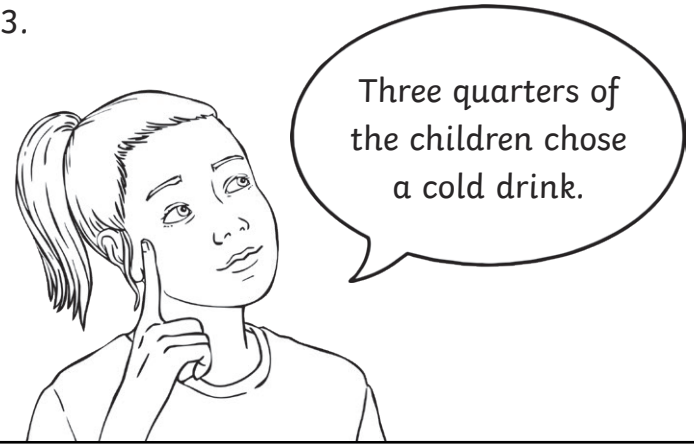
Do you agree with Anna?
Explain your reasoning.

2.



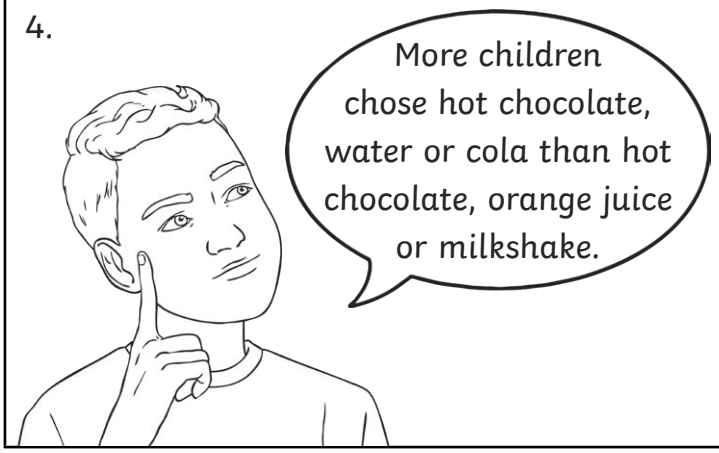
Do you agree with Jakob?
Explain your reasoning.

3.



Do you agree with Liana?
Explain your reasoning.

4.



Do you agree with Mitchell?
Explain your reasoning.

At the Cafe Pie Charts **Answers**

Question	Answer
1. "Half of the children chose a fizzy drink." Do you agree with Anna? Explain your reasoning.	
Anna is right. One quarter of the children chose lemonade and one quarter of the children chose cola. Two quarters is equivalent to one half.	
2. "20 children chose lemonade." Do you agree with Jakob? Explain your reasoning.	
Jakob is incorrect. 15 children chose orange juice and that sector is one eighth of the pie chart. One eighth is half of a quarter, and the chart shows that a quarter of the children chose lemonade. Therefore, 15 is half of the value of lemonade, so 30 children chose lemonade.	
3. "Three quarters of the children chose a cold drink." Do you agree with Liana? Explain your reasoning.	
Liana is incorrect. The only hot drink is hot chocolate and the hot chocolate sector is one eighth of the pie chart. Therefore, seven eighths of the children chose a cold drink.	
4. "More children chose hot chocolate, water or cola than hot chocolate, orange juice or milkshake." Do you agree with Mitchell? Explain your reasoning.	
Mitchell is right. The sectors for hot chocolate, water and cola together make one half of the pie chart and totals 60 children. The sectors for hot chocolate, orange juice and water together make three eighths of the pie chart and totals 45 children. One half, 60 children, is more than three eighths, 45 children.	

Statistics | Cafe Pie Charts

I can read and interpret pie charts.		
I can describe how data is presented in a pie chart.		
I can use fractions to answer questions about data presented in a pie chart.		
I can reason about data represented in pie charts.		

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