[MATHS PROBLEM]

# BAR CHARTS VERSUS PIE CHARTS

Students often struggle to compare the benefits offered by different types of statistical charts, says **Colin Foster**

In this lesson, students explore the advantages and disadvantages of bar charts and pie charts.

THE DIFFICULTY

Five different colours are available for painting a youth centre. Each child in the youth centre chooses their preferred colour. These two charts both show the same data about their choices.
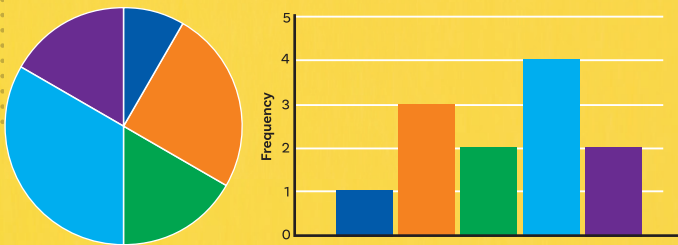
Which chart do you prefer? Why?
This question is just to get students thinking about their personal preferences and what they might depend on.

THE SOLUTION

Try using the two charts to answer these questions.
*Which chart do you find easier to use for each question? Why?*
1. Which was the most popular colour?
2. How many children altogether were in the youth centre?
3. Which colour was *three times* as popular as another colour?
4. Which colour did *a quarter* of the children choose?
5. Did *more than half* of the children choose *some kind* of blue?
6. How many *more* children chose orange than dark blue?

Here are answers and some comments.

	Answer	Comments
1	Light blue	Easy to see from either chart, but maybe easier from the bar chart.
2	12	Need the bar chart.
3	Orange	Easier to be sure from the bar chart.
4	Orange	Easier to see (rather than calculate) the fraction from the 90° sector in the pie chart.
5	No	Easier to see in the pie chart.
6	2	Need the bar chart.

If you want to see the exact frequencies, or differences in frequencies, then the scale on the bar chart is necessary. Most people find the areas of rectangles (on a bar chart) easier to compare visually than the areas of sectors of a circle (on a pie chart).

If you want to see proportions, then the pie chart may be easier, especially if the total frequency (as here) is a multiple of 12. Imagining a clockface around the pie chart can often make it easier to draw conclusions without needing to use an angle measurer. The corner of a piece of paper can be useful for comparing with 90°.
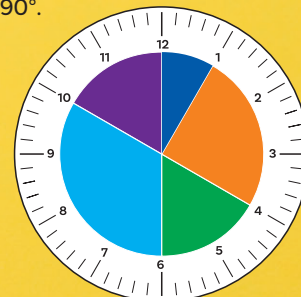
Checking for understanding
Make up some data like these and represent them in both a bar chart and a pie chart. Invent 3 questions that are easier to answer using the bar chart, and 3 questions that are easier to answer using the pie chart. See if your partner agrees.

Colin Foster (@colinfoster77) is a Reader in Mathematics Education in the Department of Mathematics Education at Loughborough University. He has written many books and articles for mathematics teachers. foster77.co.uk, blog.foster77.co.uk