Unit 4D Collecting and presenting information: questionnaires and pie charts

ABOUT THE UNIT

In this unit children learn how to use a data handling package to create bar charts, pie charts and line graphs, and how to use this information to support an argument.

Children learn to collect information in a way that it can be easily processed; enter data correctly; select and create an appropriate graph for their purpose; consider how to frame questions. They also learn to compare the effectiveness of different charts and use their charts to test hypotheses.

Children will be able to apply what they have learnt in this unit when collecting information and producing graphs and charts in mathematics, geography and science.

WHERE THE UNIT FITS IN

Builds on Unit 1E 'Representing information graphically: pictograms', and Unit 3C 'Introduction to databases'. This unit assumes that children:

- can enter and save data
- can create pictograms and bar charts
- can interpret pie charts and line graphs.

TECHNICAL VOCABULARY

- questionnaire
- pie chart
- line graph
- bar chart

RESOURCES

- graphing package
- measuring equipment
- data handling package
- examples of different graphs

EXPECTATIONS

at the end of this unit

most children will:	collect data in a way that aids entry into a data handling package and use it to create bar charts, pie charts and line graphs
some children will not have made so much progress and will:	collect data and enter it into a data handling package and use it to create bar charts, pie charts and line graphs
some children will have progressed further and will:	collect data in a way that aids entry into a data handling package and choose the appropriate form of graph to represent it

QCA

LEARNING OBJECTIVES	POSSIBLE TEACHING ACTIVITIES	LEARNING OUTCOMES	POINTS TO NOTE

SETTING THE SCENE

CHILDREN SHOULD LEARN		CHILDREN	
• **key idea:** that different graphs are used for different purposes	◆ Collect examples of different graphs, for example bar charts that show monthly rainfall, line charts that show people's growth, pie charts that show how people spend money. Discuss with the class how the different graphs represent data.	• understand that different graphs are used for different purposes	Explain to the class how: bar charts make comparisons; pie charts show how things divide; line graphs show continuously varying data.

SHORT FOCUSED TASKS

• **technique:** to design simple questionnaires to record numbers, text and choices	◆ Remind the class about fields and records. Tell the class that they are going to produce a school database with information about all the children in the school. Tell them that they will use the database to answer questions about their peers and discuss how this could be useful for particular purposes, such as organising sports day and trips. ◆ Produce a class list of fields and discuss how they could collect the necessary information. Introduce the idea that information could be collected more quickly using a standard sheet, and that entering and checking information would be easier if the structure of the sheet matched the fields. Remind the class about number, text and choice fields. Remind the class that the computer will only treat things as the same if they are called the same. Ask the children to design questionnaires to collect the data and help them create a database with suitable fields. Ask the children to produce questions which others in the class can answer.	• design questionnaires which match the structure of the database	Children could collect information as homework. Encourage the children to think about issues of privacy and confidentiality by asking them who should have access to the information and who should not. Examples of possible fields include: boy or girl, month of birth, number of siblings, hair/eye colour.
• **key idea:** that pie charts can be used to make comparisons between populations • **technique:** to use ICT to create pie charts	◆ Discuss with the class how they are going to check whether the balance between boys and girls in their class is the same as for the school as a whole. ◆ Enter the number of boys and girls for the class and for the school into a data handling package. Remind the class that they can create different types of charts to represent the information. Produce two bar charts (one for the class and one for the school) and make comparisons. Discuss how difficult it is if one chart is much larger than the other. Create two pie charts showing the two distributions. Discuss that although pie charts do not show that there are more boys and girls in the school than in the class, they are more useful for making comparisons. ◆ Discuss other hypotheses that could be tested using pie charts, for example, that boys are more interested in football than girls, or that the news is more popular with their parents than with them, or that children with brown hair usually have brown eyes. Ask the children to collect information and produce pie charts to test these hypotheses.	• produce pie charts using ICT and recognise that the larger the segment, the larger the proportion • use pie charts to make comparisons between populations	Some children will be able to collect data, enter it and produce pie charts, but may not be able to use the charts to support an argument.
• **key idea:** that line graphs can be used to show continuously changing information • **technique:** to use ICT to create line graphs	◆ Enter the results from a science experiment, such as the length of a shadow throughout the day, into a data handling package. Use the package to produce a pie chart, bar chart and line graph. Discuss how the pie chart is not clear. Discuss the bar chart. Choose adjacent bars and ask the class if the shadow 'jumped' from one length to the next. Discuss how the line graph shows that the shadow's length changed smoothly. Ask the class to think of other things that change smoothly.	• understand that line graphs are used to represent continuously changing data	Data logging, where children see the graph being drawn as time passes, and simulations of time dependent events offer useful introductions to line graphs.

INTEGRATED TASK

• to interpret and analyse information in graphs	◆ Investigations in science, mathematics and geography provide ways of drawing together the key ideas and techniques taught in this unit.	• use bar charts, pie charts and line graphs appropriately	Children could gather data from the Internet; for example, data on train times to test the hypothesis that train journeys take longer on Sundays.