

Scheme of work: 5B**Analysing data and asking questions: using complex searches****Activity description**

In science, pupils devised a series of investigations exploring different properties of fabrics. In order to record their findings the class devised a data collection sheet. Through discussion, they agreed the format, including the use of yes/no fields and numeric fields. Pupils went on to carry out the investigations and recorded their findings using the data collection sheet.

Later, pupils were shown how to enter data into the database. The teacher discussed the need for consistency and accuracy, and for verification. This involved each pupil entering one record and checking another record.

In a subsequent lesson, the teacher created a number of design scenarios. Pupils were asked to identify the best materials for a range of products such as waterproof gloves, a tea cosy and a hood for a baby buggy. Pupils used the scenarios as a basis for interrogating the database. The teacher taught the class how to turn 'everyday' questions into a form suitable for use with the database. For example, 'I need a material that is waterproof and transparent' needed to be translated as 'Waterproof = YES AND Transparent = YES' in order to search the database. Pupils then had opportunities to interrogate the database identifying suitable materials for a variety of design problems.

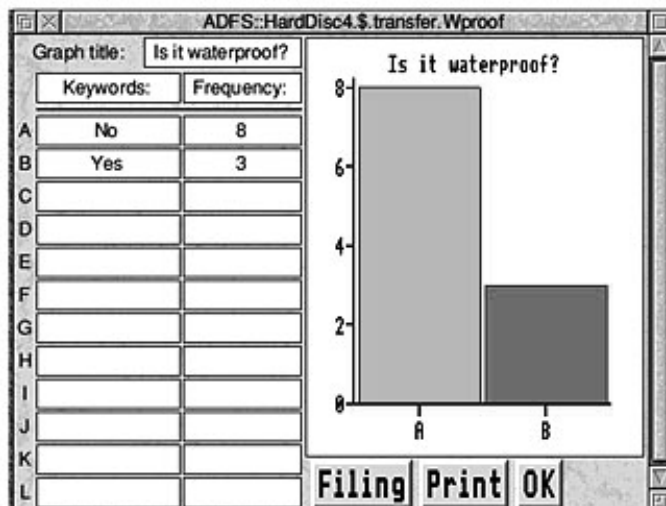
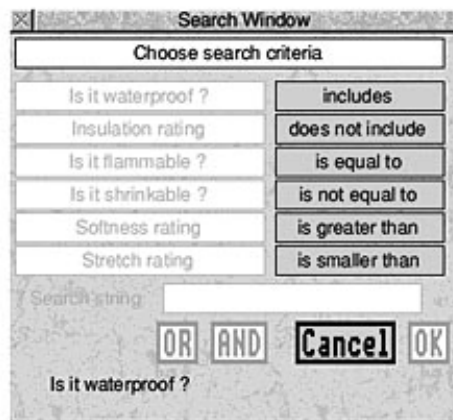
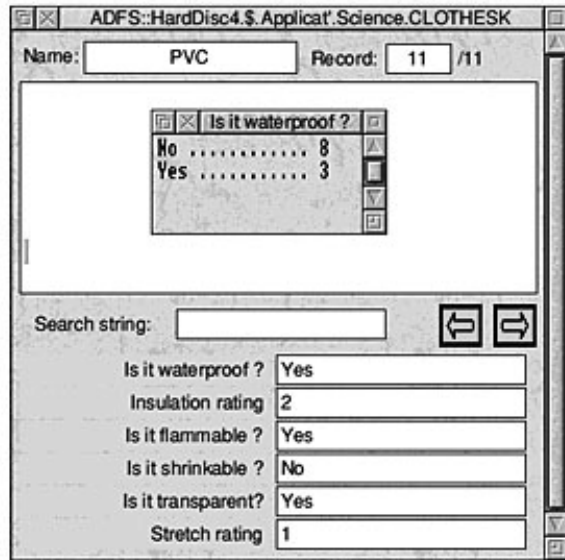
Activity objectives

- Add to and amend data using a flat-file database
- Search a database using two or more criteria, using 'AND', 'OR', 'greater than' and 'smaller than'
- Use information in a database to answer questions

Commentary

The pupil entered data into a flat-file database. As a result of the verification process, he was aware of the need for consistency in data and, where necessary, amended the information. He was able to interrogate the database using a variety of searches, including the use of '=' and 'AND'. He translated everyday questions, such as 'The hood for a baby buggy needs to be waterproof and transparent', into a language suitable for the database, such as 'water = YES AND transparent = YES'. He also interrogated the database to answer straightforward questions.

This example illustrates aspects of work at **level 3**. The pupil has used ICT to **solve problems**. He is able to **find and use appropriate stored information following straightforward lines of enquiry**. To make further progress the pupil could be given opportunities to create his own database in a different context, making independent choices about fields and data-types.



Scheme of work: 4D**Collecting and presenting information:
questionnaires and pie charts****Activity description**

Pupils carried out a series of investigations in science. The investigations required the class to measure and record the lung capacity, height and weight of different pupils.

The teacher reminded the class, through a brief demonstration, how to use ICT to draw graphs. The class discussed the range of charting options available in the software, including scatter graphs and best-fit lines.

Pupils were asked to test the hypothesis: 'The more you weigh, the more air you can fit in your lungs'. They were asked to enter data in a spreadsheet and produce a variety of graphs to assist in their investigations.

Pupils entered their records into a spreadsheet and produced charts. They were asked to annotate their charts, drawing conclusions about the hypothesis.

Activity objectives

- Use a computer model to identify patterns and relationships
- Interpret data and check it is relevant and reasonable
- Form a conclusion on the evidence presented

Commentary

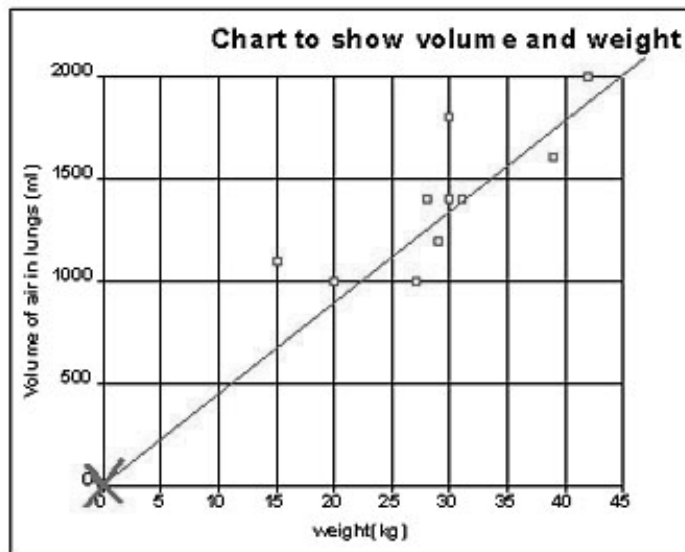
In this example the pupil collected, designed and entered data into a spreadsheet. He used the software to create a chart. The graphical representation of the data was used to identify visually a linear relationship and the pupil annotated his scatter graph with a line of best fit. He identified a pattern in the chart that supported the hypothesis he was asked to test. His response to the teacher's questions indicated that he understood that his model was based on a limited amount of data. He made suggestions about extending the work, noting that adding additional data would make the findings more reliable.

This example illustrates aspects of work at **level 3**. The pupil used ICT to **organise and share** his findings with the teacher as a response to a short focused task. In his response to the teacher he was beginning to consider questions of validity and plausibility.

To make further progress the pupil could be given opportunities to undertake additional investigations and construct a database to organise and interrogate data. He might combine information from different sources and produce a report for a specific audience.

Prediction: The more you weigh, the more air you can fit in your lungs.

	a	b	c
1	name	weight(kg)	vol of air in lungs (ml)
2	Melissa	42	2000
3	Michael M	39	1600
4	Ryan	31	1400
5	Liam	30	1400
6	Adam	30	1800
7	Ayshea	29	1200
8	Kelly	29	1200
9	Kieran	28	1400
10	Elizabeth	27	1000
11	Laura	15	1100
12	Tyruie	20	1000



Conclusion: Generally the more you weigh the bigger your lungs are.

Scheme of work: 2E

Questions and answers

Activity description

Pupils took part in a survey exploring the density and movement of traffic on different roads around the school over a morning. They then used a graphing program to investigate traffic flow.

Teachers reminded pupils how to use a tally chart to record their observations. Groups of pupils undertook surveys, noting the numbers of vehicles travelling in each direction along a road. Back in class, the teacher demonstrated how to enter data into a graph drawing program. The class looked at different types of graphs available in the program and agreed that bar charts were the best way to present their data.

Later, pairs of pupils entered their data into the program to produce charts. As a group the class discussed their findings and noted that the west-to-east road was the busiest, with more cars travelling towards London. The road going north to south was less busy.

For homework, the class was asked to think of reasons why this might be the case. They were also asked to think about what the pattern of traffic might be if they carried out their survey in the late afternoon.

Activity objectives

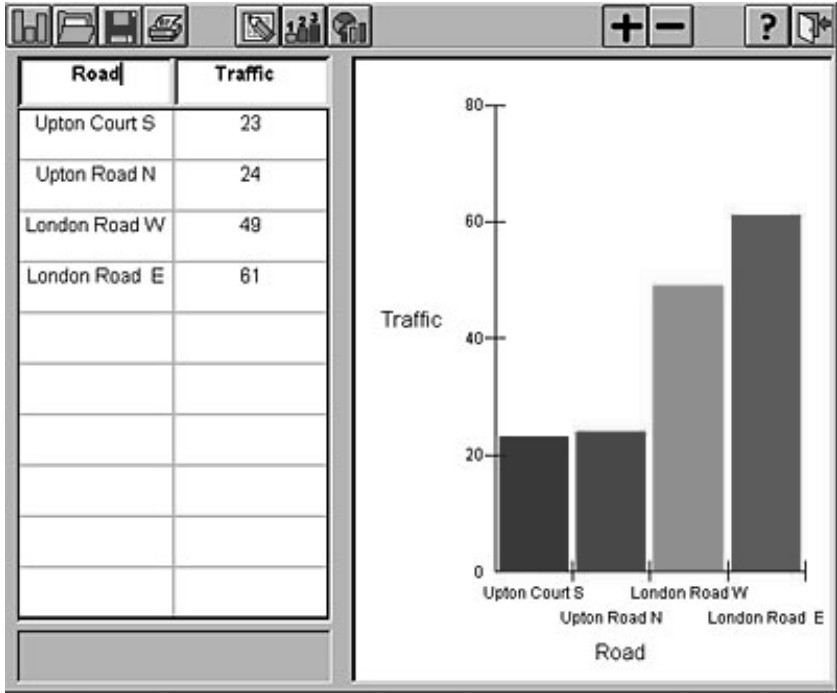
- Gather data directly from observation using a tally chart to record findings
- Enter data into an information handling program to present it graphically
- Answer simple questions using the graph

Commentary

In this example the pupil collected data using a tally chart and entered the data into a graphing program. She combined data collected directly with data from another pupil's survey of a different road. She used the software to create a graph showing the comparison between the frequency of traffic on two roads. The pupil printed the graph and used it to answer questions set by the teacher. She identified the busiest road, giving reasons why this might be the case.

This example illustrates aspects of work at **level 2**. The pupil **used ICT purposefully to organise data and present her findings**.

To make further progress the pupil might be given opportunities to collect, organise and investigate information by creating a straightforward database.



Scheme of work: 1E

Representing information graphically: pictograms

Activity description

In this example, pupils were asked to conduct a survey on the variety of family sizes within the class.

Pupils were then shown how to construct a tally chart. Using a chart pupils collected information from the rest of the class. Later, the teacher demonstrated to the class how information from a tally chart could be entered into simple data handling software and used to create a pictogram.

Throughout the week pupils took turns to enter their data into the program and print out their results.

The teacher asked pupils to use the print-outs to answer simple questions such as: 'Which is the most common size of family?'

Activity objectives

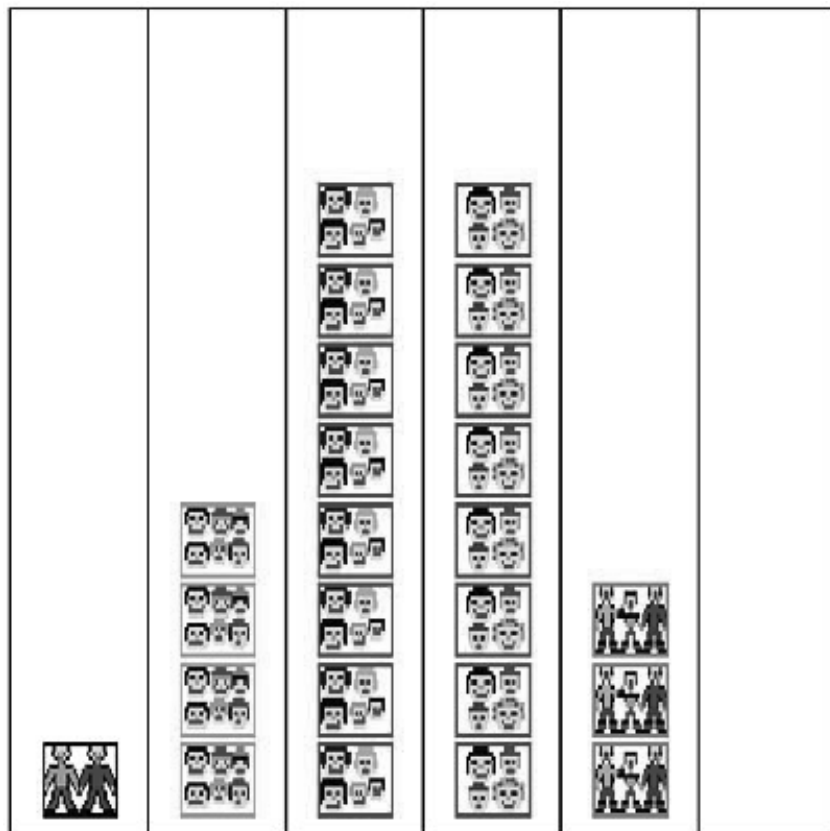
- Understand that data can be collected and presented graphically as a pictogram
- Use ICT to create pictograms
- Use pictograms to answer simple questions

Commentary

In this example the pupil has used ICT successfully to create a pictogram. She has collected and entered data into the program to present information graphically. She has then used the pictogram to answer simple questions such as: 'Which is the most common family size?'

This example illustrates aspects of work at **level 1**. The pupil collects data using a tally chart and creates a pictogram showing some understanding that **information exists in different forms**. She works with text, numbers and images to **share information** and answer straightforward questions.

To make further progress the pupil might be given opportunities to collect, organise and investigate information using a simple database package.



Year 1 pupil's work: pictogram on family size created with ICT.