

Y7	UNIT 11 <i>Data Collection and Presentation</i> Lesson Plan 1	<i>Types of Data</i>																						
<i>Activity</i>  1	<p><b>Arranging data</b></p> <p>T: In this unit we'll learn how to collect, classify and display data; data is information that is used in any process connected with statistics.</p> <p>We'll start by looking at the information on the OHP, which gives us a number of statements about James.</p> <div><ul style="list-style-type: none"><li>James lives in Birmingham.</li><li>James was born in Exeter.</li><li>James is 43 years old.</li><li>James is married.</li><li>James and his wife have 3 children.</li><li>James is an engineer.</li><li>James is tall; his height is about 194 cm.</li><li>James weighs 96 kg.</li><li>James owns a car.</li><li>James' favourite rock group is Led Zeppelin.</li></ul></div> <div><table><tr><th>Questions/Headings</th><th>Answers/Data</th></tr><tr><td>Place of residence</td><td>Birmingham</td></tr><tr><td>Birthplace</td><td>Exeter</td></tr><tr><td>Age (years)</td><td>43</td></tr><tr><td>Married</td><td>Yes</td></tr><tr><td>Children</td><td>3</td></tr><tr><td>Profession</td><td>Engineer</td></tr><tr><td>Height</td><td>194 cm</td></tr><tr><td>Weight</td><td>96 kg</td></tr><tr><td>Car</td><td>Yes</td></tr><tr><td>Music</td><td>Led Zeppelin</td></tr></table></div> <p>T: Which of the questions are answered with numerical data? <i>(Age, children, height, weight)</i></p> <p>Are there any differences in the numerical data? <i>(Units)</i></p> <p>What is meant by 'about 194 cm'? <i>(193.5 cm ≤ height &lt;194.5 cm)</i></p> <p>Is James' weight exactly 96 kg? <i>(Probably to the nearest kg)</i></p> <p>Has James got exactly 3 children, or is it better to say he has 'about 3 children'? <i>(He has exactly 3 children; we do not say he has 'about' 3 children)</i></p> <p>etc.</p> <p style="text-align: right;"><i>10 mins</i></p>	Questions/Headings	Answers/Data	Place of residence	Birmingham	Birthplace	Exeter	Age (years)	43	Married	Yes	Children	3	Profession	Engineer	Height	194 cm	Weight	96 kg	Car	Yes	Music	Led Zeppelin	<p><i>Notes</i></p> <p>Whole class activity.</p> <p>Statements appear on OHP.</p> <p>T asks a P to read out the sentences clearly.</p> <p>Then T and Ps discuss how to present the data under headings in a table.</p> <p>T writes table on BB, Ps in Ex.Bs. Then Ps try to classify data as to whether or not is numerical, and then compare numerical data.</p> <p>Finally, T introduces the concepts of <i>quantitative, discrete</i> and <i>continuous data</i>.</p>
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2	<p><b>Types of data</b></p> <p><b>OS 11.1</b></p> <p>T asks some extra questions for part (a): e.g.</p> <p>"Explain why 'Age', 'World Ranking' and 'Aces' are discrete data".</p> <p>"Why are 'Height' and 'First Serve Max Speed' continuous data?"</p> <p style="text-align: right;"><i>18 mins</i></p>	<p>Whole class activity.</p> <p>Task appears on OHP (Ps also look at chart in Ex.Bs, p157).</p> <p>After redefining types of data (qualitative, discrete and continuous), Ps go over questions on p156-157 of PB interactively.</p> <p>T asks and points to P to answer question by question.</p> <p>Agreement. Praising.</p>																						

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<b>Activity</b> <b>3</b>	<b>Data - quantitative and qualitative</b> <b>PB 11.1, Q1</b>  25 mins	<b>Notes</b>  Individual work, monitored, helped. Oral checking. Agreement. Feedback. Praising.
<b>4</b>	<b>Further practice with types of data</b> <b>OS 11.2</b> <b>T: (Extra questions)</b> Which place of birth appears most frequently in the database? (Plymouth) Which age appears most frequently? (12 years) Which occurs most frequently - boys or girls? (Girls) What is the age difference between the oldest and the youngest people listed? (14 – 7 = 7 years)  32 mins	Whole class activity, question by question, interactively. Then T makes Ps read the data to see the connections, and then asks extra questions.  Agreement. Praising.
<b>5</b>	<b>Creating and using a database</b> <b>PB 11.1, Q4</b>  45 mins	Group activity. T puts class in 4 groups of 6-8 pupils (e.g. by seating). Each group nominates a spokesperson to obtain the data and record it in a table. Spokespersons agree on the headings for the last two columns and then start to ask their own group for data. T monitors, helps. Then each group writes down the answers to questions in part (d). When each group is ready, spokespersons read out their answers. Now spokespersons discuss their data and summarise it all, with T monitoring and helping. Results are given to class. All Ps then discuss together the deviations of the groups' results from the whole class results.
	<b>Set homework</b> <b>PB 11.1, Q2</b> <b>PB 11.1, Q3</b>	

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<i>Activity</i>		<i>Notes</i>
<b>1</b>	<p><b>Checking homework</b></p> <p><b>PB 11.1, Q2</b> (a) (iii), (iv) (b) (ii), (v), (vi), (viii), (ix) (c) (i), (vii), (x)</p> <p><b>PB 11.1, Q3</b> (a) This will be a whole number. (b) This number can be of any value. (c) 'Colour', 'Trailer/Caravan' (d) 33 mph (e) 2 cars (f) Red (g) 36 mph (h) L</p> <p style="text-align: right;">4 mins</p>	<p>Oral checking and review of types of data.</p> <p>Agreement, feedback, self-correction. Praising.</p>
<b>2A</b>	<p><b>Representing data</b></p> <p><b>OS 11.3, Question A, Tally chart</b></p> <p>T: How many of the pupils walk to school? (9) Which method of travel is used by six of the pupils? (Car) Which method of travel is the least used? (Bike) How many times as frequent is the number of pupils travelling by the most popular method than the number travelling by bike? (4)</p> <p><b>2B</b> <b>OS 11.3, Question B, Pictogram</b></p> <p>T: So each person in the pictogram represents 2 people in real life. Can you think of another way of representing this data? Look at the numbers in the tally chart. What do they have in common? (All are multiples of 3)</p> <p><b>2C</b> <b>Drawing a pictogram</b></p> <p>T (if Ps have not suggested this already): Let's make another pictogram to illustrate the data, with each person in the pictogram representing 3 pupils.</p> <p><b>2D</b> <b>OS 11.3, Question C, Other ways of illustrating data</b></p> <p>T: Can you remember a method we used to illustrate data at the beginning of the school year?</p> <p style="text-align: right;">18 mins</p>	<p>Whole class activity.</p> <p>Task appears on OHP and each pair of Ps has a copy.</p> <p>T introduces the tally chart, showing how data collected can be counted easily.</p> <p>Ps count on their copy; T asks, Ps answer and come to OHP to complete the table. Then T asks other questions.</p> <p>Agreement. Praising.</p> <p>T now introduces pictogram as a possible way of representing data. After answering question B, T can ask Ps if they can suggest another pictogram to show this data.</p> <p>Individual work, monitored, helped.</p> <p>Oral checking. Feedback, self-correction. Praising.</p> <p>Whole class activity.</p> <p>T helps Ps to recall bar charts.</p> <p>T draws the chart on BB, Ps in Ex.Bs.</p>



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<i>Activity</i>	<p>Set homework</p> <ol style="list-style-type: none"> <li>1. OS 11.6, Bar Chart</li> <li>2. PB 11.2, Q7</li> <li>3. Using the data in the previous question, draw a pictogram to illustrate the numbers and types of pets owned by these children.</li> </ol>	<p><i>Notes</i></p> <p>T tells Ps that they will need a protractor, a pair of compasses and a ruler for the next lesson.</p>

Y7	UNIT 11 <i>Data Collection and Presentation</i> Lesson Plan 3	<i>Collecting Data 2</i>
Activity		Notes
<p>1</p> <p>2A</p> <p>2B</p> <p>2C</p> <p>(continued)</p>	<p><b>Checking homework</b></p> <p>1. OS 11.6, Bar Chart</p> <p>2. PB 11.2, Q7 (a) 4 (b) 6 (c) Girls (d) 5 (e) Rabbit (f) Rabbit</p> <p>3. Using the data in the previous question, draw a pictogram to illustrate the numbers and types of pets owned by these children.</p> <p style="text-align: right;">5 mins</p> <p><b>Revision work with fractions: mental work</b></p> <p>T: How much of the work in Unit 10 have you forgotten? We'll see ...</p> <p>What is <math>\frac{1}{4}</math> of 12 (3)</p> <p><math>\frac{1}{3}</math> of 15 (5)</p> <p><math>\frac{1}{7}</math> of 21 (3)</p> <p><math>\frac{1}{20}</math> of 180 ? (9)</p> <p>What is <math>\frac{1}{18}</math> of 36 (2)</p> <p><math>\frac{1}{18}</math> of 360 ? (20)</p> <p><b>Preparation for preparing a pie chart</b></p> <p>T: How do we find <math>\frac{3}{4}</math> of 12 ? (<math>\frac{12}{4} \times 3</math>)</p> <p>T: Well done. Now find the answers to these:</p> <p><math>\frac{2}{3}</math> of 12 (8)</p> <p><math>\frac{3}{5}</math> of 20 (12)</p> <p><math>\frac{5}{18}</math> of 36 (10)</p> <p><math>\frac{5}{18}</math> of 360 (100)</p> <p><b>Constructing a pie chart</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>At the final dinner of an international conference there were 2 German, 5 American, 7 Russian, 1 Chinese and 3 English delegates. A circular pie was cut into as many slices of equal size as there were delegates, so that each one was given a slice.</p> </div> <p>T: What fraction of the pie did each delegate receive? (<math>\frac{1}{18}</math>)</p> <p>What fraction of the pie did the American delegation receive? (<math>\frac{5}{18}</math>)</p>	<p>Tasks 1 and 3 are checked on OHP (chart and histogram prepared by T in advance). Task 2 is checked orally. Feedback, self-correction. Praising.</p> <p>Mental work. T asks, points to P, P answers. This warm-up activity leads on to representation of data on a pie chart.</p> <p>Agreement. Praising.</p> <p>A P is called to front and writes answer on BB. Praising. Quicker Ps will be able to calculate mentally, slower ones may need to write, and can write on BB as they do the calculations and give their answers.</p> <p>Whole class activity. This activity leads directly into the preparation of pie charts as a possible way of displaying data.</p> <p>The information appears on OHP.</p> <p>After T has read out problem, T asks questions preparing Ps for sketching the pie.</p>

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<b>Activity</b> <b>2C</b> (continued)	<p>T: Can you draw a sketch of the pie cut into five pieces according to the nationalities of the delegates? How should it be cut?</p> <p>How many degrees are there around a point? (360°)</p> <p>What is the angle for one person? (20°)</p> <p>What is the angle for the Russian delegation? (140°)</p> <p>etc.</p> <p>T: Can you remember how to draw angles?</p> <p>T: Now use your ruler, protractor and compasses to construct the pie in your Ex.B.</p> <p style="text-align: right;">20 mins</p>	<b>Notes</b>  T (on BB) and Ps (in Ex.Bs) draw a sketch, in preparation for the construction. Now T, at BB, demonstrates, with the help of Ps, how to construct the pie chart, using the board ruler, protractor and compasses. Ps construct pie chart in Ex.Bs; T monitors, helps where necessary.
<b>3</b>	<p><b>Methods of displaying data</b></p> <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <p>There were 18 delegates at an international conference; 2 were German, 5 American, 7 Russian, 1 Chinese and 3 English. Display this data on a pictogram and a bar chart.</p> </div> <p>T: Does the pie chart show the data fairly? Can we see information about the participants' nationalities on it?</p> <p style="text-align: right;">27 mins</p>	<p>Individual work, monitored, helped.</p> <p>This helps Ps to remember what they have already been taught, and the comparison with the previous task is useful.</p> <p>Each pair of Ps (by seating) shares the task, one drawing a pictogram and the other a bar chart.</p> <p>Checking at BB. T sketches the solution (pictogram and bar chart) close to the pie chart constructed previously. After checking (feedback, self-correction, praising), T asks Ps if they know why the pie chart is relevant.</p> <p>Then T explains the use of the pie chart for representing data.</p>
<b>4</b>	<p><b>Testing a hypothesis</b></p> <p>T: Peter stated his hypothesis that the most popular flavour crisps of the majority of pupils in his class was 'cheese and onion'.</p> <p style="text-align: right;">38 mins</p>	<p>Whole class activity.</p> <p>Firstly, T and Ps discuss the meaning of 'hypothesis', to ensure that they understand it. Then T asks Ps how to proceed, step by step, T working at BB and Ps in Ex.Bs. Praising.</p> <p>Finally, T brings in the notion of 'mode' (Ps could write definition in their Ex.Bs)</p>
<b>5</b>	<p><b>Pie Charts OS 11.5</b></p> <p style="text-align: right;">45 mins</p>	<p>Individual work. Each P has a copy of OS 11.5 and works on it. Checking at OHP. Agreement, feedback, self-correction. Praising.</p>
	<p><b>Set homework</b></p> <p><b>PB 11.2, Q3</b></p> <p><b>PB 11.2, Q6</b></p>	<p>T asks Ps to each bring a 10p coin to the next lesson.</p>





<b>Y7</b>	<b>UNIT 11</b> <i>Data Collection and Presentation</i> Lesson Plan 4	<i>A Fair Bet</i>
<b>Activity</b>		<b>Notes</b>
<b>4A</b>	<b>Tossing a coin</b> T: Take your 10p coin and test to see if it is fair or not. Toss the coin six times and write down whether it shows 'Heads' or 'Tails'.	Whole class activity. Everybody tosses their coin, then T asks Ps if their coin is fair. They illustrate, for example, the result '2 Heads, 4 Tails' on a pie chart at BB, and discuss the reason for so many unfair coins.
<b>4B</b>	<b>Another experiment</b> T: Now let's do another experiment. Draw a tally chart. Toss your coin 30 times, count the frequencies and illustrate the data on a pie chart.	Individual work. T monitors Ps' work, helping and checking, until everyone has finished and prepared their pie chart. Now Ps can compare their pie charts with the data recorded previously (after only 6 tosses of the coin). Discussion.
	38 mins	
<b>5</b>	<b>Illustrating data and analysing results</b> <b>PB 11.2, Q9</b>	Individual work. T asks Ps to use a bar chart to illustrate the data. Checking of part (a) at OHP. T has prepared the tally chart and the bar chart on an OS, so Ps can check for themselves if they were successful. Ps and T discuss part (b). Feedback, self-correction. Praising.
	45 mins	
	<b>Set homework</b> <b>Activity 11.4</b>	Each P has a copy of Activity 11.4 and Resource Sheet 11.4
<i>(continued)</i>		