

Data Handling

Teaching Notes

Noemi Navas Arranz

Escola Bufalà

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University of Aberdeen

UNIT: DATA HANDLING		
Lesson: 0 – Snack for the break	Timing: 2 weeks	
Activities	Grouping	Materials and resources
<p>Previous data Among the two weeks before doing the unit, from Monday to Friday, pupils should record the snack they bring to school for the break.</p>		
<p>Snack for the break When going to the playground, each pupil writes in a chart on the wall the snack s/he brought. F = Fruit, S = Sandwich, C = Cake (sweet snack), O = 'Other', N = Nothing.</p>	<p>Whole group Individual</p>	<ul style="list-style-type: none"> • 'Snacks chart' – SM p.1

UNIT: DATA HANDLING		
Lesson: 1 – Preparing a survey	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>Introduction The teacher asks each pupil ‘<i>What snack did you bring today?</i>’ and writes the answers on the board without organization, in a messy way. The teacher asks the students whether it is easy or not to see how many pupils brought each type of snack. The teacher proposes to do it by using tally marks. Pupils notice the need to organize data. The teacher suggests them to gather and organize their own data.</p>	Whole group	<ul style="list-style-type: none"> • Board and chalk
<p>Forming groups The teacher tells the pupils that they have to organize themselves into 5 groups (5 pupils in each group). They have to follow these rules, which can be written on the board: <i>In each group there must be boys and girls</i> <i>In each group there must be pupils with different learning styles and abilities.</i> <i>No one can be left out.</i> Pupils organize themselves to make the groups.</p>	Whole group	<ul style="list-style-type: none"> • Board and chalk or smartboard or projector and white screen
<p>The roles Once the groups are done, a different letter is given to each group (A, B, C, D and E). Within each group, pupils have to decide what number each of them is (1, 2, 3, 4 and 5). They can use the ‘discussion and agreement’ language frame. So, each pupil has a letter and a number (such as A3, B4 or D1). These letters and numbers are going to identify them during the whole unit. Then, the different roles are explained. The teacher hangs on the walls cards with the name and the definition of each role. In each group there are five roles:</p>	Whole group Small groups	<ul style="list-style-type: none"> • ‘Discussion and agreement’ language frame – SM p.19-20 • Role cards – SM p.2-3 • Number cards – SM p.4

<ul style="list-style-type: none"> - Language monitor: is the pupil who should check that communication takes place in English. - Volume monitor: is the pupil who should keep the volume of the group low. - Material monitor: is the pupil who should take care of the material – hand out, gather, switch on/off, tables, chairs. - Secretary: is the pupil who should write down or type the group agreements or tasks. - Speaker: is the pupil who shares with the rest of the class the ideas, opinions or agreements of the group. <p>In each lesson, pupils have a different role. The designation of the role can be done in a rotary way, so, all the pupils go through all the roles. In lesson 1, all the pupils who have number 1 (A1, B1, C1, D1 and E1) are language monitors, number 2s are volume monitors, number 3s are material monitors, number 4s are secretaries and number 5s are speakers. Next lesson, each pupil will have a different role. The teacher explains how it works and sticks a card with the number on each role card. If the pupils can not remember their role, they can check it by looking at the cards. The teacher can check whether they know which role they have by asking all the material monitors to raise their hands, and then asking one of them to explain what their role is, and so on with the other roles.</p>		
<p>Choosing a topic When the pupils are in groups, the teacher presents the 5 different topics, and each group decides on a topic. The 5 topics are related to good and bad habits: healthy diet, ecology, media, hygiene & housework and leisure time & exercise. They can be presented by means of the topics_presentation PowerPoint. Pupils should discuss and agree within the groups. When the topic is chosen, by means of the speaker, they share it with the rest of the class. If two groups have chosen the same topic, one of the groups can change the topic or it can be</p>	<p>Whole group Small groups</p>	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Topics_presentation ppt - SM • 'Discussion and agreement' language frame –

decided by means of drawing lots.		SM p.19-20
<p>Forming questions Pupils should prepare a list of 5 questions related to their topic to do a survey of all their classmates. They have a language frame to help them form questions. Pupils should take into account that they need 1 closed (multiple choice) question and 4 open (number) questions because they will need the answers to calculate frequency and average. Questions must be written down.</p>	Small groups	<ul style="list-style-type: none"> • 'Forming questions' language frame – SM p.21-24 • Pens and paper
<p>Extra activities for fast-finishers or for doing at home http://www.bbc.co.uk/education/mathsfile/shockwave/key/datakey.html http://www.bbc.co.uk/education/mathsfile/shockwave/games/datapick.html</p>		<ul style="list-style-type: none"> •

UNIT: DATA HANDLING		
Lesson: 2 – Preparing a questionnaire		Timing: 1 hour
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 2 (A2, B2, C2, D2 and E2) are language monitors, number 3s are volume monitors, number 4s are material monitors, number 5s are secretaries and number 1s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Forming questions (second part) If in the last lesson, pupils did not finish preparing their list of 5 questions related to the topic of their survey they should finish it now. They have a language frame to help them form questions. Pupils should take into account that they need 1 closed (multiple choice) question and 4 open (number) questions because they will need the answers to calculate frequency and average. Questions must be written down.</p>	Small groups	<ul style="list-style-type: none"> • 'Forming questions' language frame – SM p.21-24 • Pens and paper
<p>Preparing the questionnaire In groups, pupils should prepare the questionnaire they are going to do. By using the computer (if possible), they have to create the chart they will use to gather the information. Using a smartboard or projector and white screen, the teacher shows them a sample chart and how it works. They have to take into account the possible answers and the space they will need to gather the answers of 5 pupils. When they finish, and it is checked by the teacher, they need to print a copy for each pupil in the group. They should create another chart, or use the same one, to gather the information of all the group members.</p>	Small groups	<ul style="list-style-type: none"> • 5 computers or laptops and printer (if possible, if not paper, pens, pencils and rulers) • Smartboard or projector and white screen • Sample

		questionnaire chart – SM p.5
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UNIT: DATA HANDLING																																						
Lesson: 3 – The survey		Timing: 1 hour																																				
Activities		Grouping																																				
		Materials and resources																																				
<p>The roles No roles are established for this lesson.</p>		Whole group																																				
<p>The survey Pupils, in groups, conduct a survey of the rest of the class. There are 5 interaction stages, as the following figures show. In each interaction there are 2 pairs of groups and a group that works on its own (see figures). Each letter and number, which they know from the previous lessons, represents a pupil.</p>		Whole group Small groups																																				
<div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; border-radius: 20px; padding: 10px; width: 45%;"> <p style="text-align: center;">SURVEY INTERACTION 1</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">A</td><td style="width: 15%;">B</td><td style="width: 15%;">C</td><td style="width: 15%;">D</td><td style="width: 15%;">E</td></tr> <tr> <td>A1 ↔ B1</td><td>C1 ↔ D1</td><td colspan="3" rowspan="5"> </td></tr> <tr> <td>A2 ↔ B2</td><td>C2 ↔ D2</td></tr> <tr> <td>A3 ↔ B3</td><td>C3 ↔ D3</td></tr> <tr> <td>A4 ↔ B4</td><td>C4 ↔ D4</td></tr> <tr> <td>A5 ↔ B5</td><td>C5 ↔ D5</td></tr> </table> <p style="text-align: center;"> Step 1 Step 2 E1 → E2 E2 → E3 E3 → E4 E4 → E5 E5: MONITOR E1: MONITOR Step 3 E5 → E1 </p> </div> <div style="border: 1px solid black; border-radius: 20px; padding: 10px; width: 45%;"> <p style="text-align: center;">SURVEY INTERACTION 2</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">D</td><td style="width: 15%;">E</td><td style="width: 15%;">B</td><td style="width: 15%;">C</td><td style="width: 15%;">A</td></tr> <tr> <td>D1 ↔ E1</td><td>B1 ↔ C1</td><td colspan="3" rowspan="5"> </td></tr> <tr> <td>D2 ↔ E2</td><td>B2 ↔ C2</td></tr> <tr> <td>D3 ↔ E3</td><td>B3 ↔ C3</td></tr> <tr> <td>D4 ↔ E4</td><td>B4 ↔ C4</td></tr> <tr> <td>D5 ↔ E5</td><td>B5 ↔ C5</td></tr> </table> <p style="text-align: center;"> Step 1 Step 2 A1 → A2 A2 → A3 A3 → A4 A4 → A5 A5: MONITOR A1: MONITOR Step 3 A5 → A1 </p> </div> </div>		A	B	C	D	E	A1 ↔ B1	C1 ↔ D1				A2 ↔ B2	C2 ↔ D2	A3 ↔ B3	C3 ↔ D3	A4 ↔ B4	C4 ↔ D4	A5 ↔ B5	C5 ↔ D5	D	E	B	C	A	D1 ↔ E1	B1 ↔ C1				D2 ↔ E2	B2 ↔ C2	D3 ↔ E3	B3 ↔ C3	D4 ↔ E4	B4 ↔ C4	D5 ↔ E5	B5 ↔ C5	<ul style="list-style-type: none"> • Questionnaires prepared by pupils in the previous class • Pens or pencils • Survey interactions ppt • Smartboard or projector and white screen
A	B	C	D	E																																		
A1 ↔ B1	C1 ↔ D1																																					
A2 ↔ B2	C2 ↔ D2																																					
A3 ↔ B3	C3 ↔ D3																																					
A4 ↔ B4	C4 ↔ D4																																					
A5 ↔ B5	C5 ↔ D5																																					
D	E	B	C	A																																		
D1 ↔ E1	B1 ↔ C1																																					
D2 ↔ E2	B2 ↔ C2																																					
D3 ↔ E3	B3 ↔ C3																																					
D4 ↔ E4	B4 ↔ C4																																					
D5 ↔ E5	B5 ↔ C5																																					

SURVEY INTERACTION 3

C	A	E	B		D
C1 ↔ A1		E1 ↔ B1			
C2 ↔ A2		E2 ↔ B2			
C3 ↔ A3		E3 ↔ B3			
C4 ↔ A4		E4 ↔ B4			
C5 ↔ A5		E5 ↔ B5			

Step 1	Step 2
D1 → D2	D2 → D3
D3 → D4	D4 → D5
D5: MONITOR	D1: MONITOR
Step 3	
D5 → D1	

SURVEY INTERACTION 4

E	C	D	A		B
E1 ↔ C1		D1 ↔ A1			
E2 ↔ C2		D2 ↔ A2			
E3 ↔ C3		D3 ↔ A3			
E4 ↔ C4		D4 ↔ A4			
E5 ↔ C5		D5 ↔ A5			

Step 1	Step 2
B1 → B2	B2 → B3
B3 → B4	B4 → B5
B5: MONITOR	B1: MONITOR
Step 3	
B5 → B1	

SURVEY INTERACTION 5

B	D	A	E		C
B1 ↔ D1		A1 ↔ E1			
B2 ↔ D2		A2 ↔ E2			
B3 ↔ D3		A3 ↔ E3			
B4 ↔ D4		A4 ↔ E4			
B5 ↔ D5		A5 ↔ E5			

Step 1	Step 2
C1 → C2	C2 → C3
C3 → C4	C4 → C5
C5: MONITOR	C1: MONITOR
Step 3	
C5 → C1	

For instance, in interaction 1, group A goes with group B, group C goes with group D and group E stays on its own.
In the two pairs of groups, they can be placed in rows and pupils ordered according

<p>to their number, in such a way that group A faces group B and group C faces group D. Pupils get in pairs in order to make the questions, A1 with B1, A2 with B2 and so on. There are two steps: in step 1, As ask Bs (Cs ask Ds) and in step 2, Bs ask As (Ds ask Cs).</p> <p>The group that is on its own needs 3 steps. In step 1, E1 asks E2 and E3 asks E4, meanwhile, E5 gets the role of language and volume monitor. In step 2, E2 asks E3 and E4 asks E5, meanwhile E1 gets the role of language and volume monitor. In step 3, E5 asks E1.</p> <p>The pupils that ask the questions have to write down the answers in the questionnaires. When interaction 1 is done, then the process starts again with interaction 2, until the 5 interactions are done.</p> <p>At the end, each pupil will have answered 5 questionnaires and interviewed 5 pupils.</p> <p>The steps of the interaction process (figures) are displayed on a ppt that can be projected on a smartboard or a white screen, in such a way that pupils can see which pupil they have to interact with at each step.</p> <p>The teacher should tell the students when they have to finish the interaction and go to the next step, but always allowing the pupils enough time to complete the task. It is important to stay near the group that is on its own at each interaction because those pupils have got 3 steps instead of 2, so they require a different pace.</p>		
<p>Gathering the information together Back in the original groups (A, B, C, D and E), pupils should put all the information together in the chart they created in the last lesson.</p>	<p>Small groups</p>	<ul style="list-style-type: none"> • Questionnaire chart created by pupils to put all the information together
<p>Self-assessment Individually, pupils do a self-assessment of lessons 1, 2 and 3 by means of the</p>	<p>Individual</p>	<ul style="list-style-type: none"> • Self-assessment: A

<p>'Self-assessment: A survey' grid. They should punctuate several statements from 0 to 10 (0 is 'I don't agree' and 10 'I absolutely agree'), write 2 stars (strong points or compliments) and 1 wish (one thing they could improve) and if they want to do so, they can write comments. They can also say what they like and don't.</p>		<p>survey' grid – SM p.13</p>
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UNIT: DATA HANDLING		
Lesson: 4 – Types of charts	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 3 (A3, B3, C3, D3 and E3) are language monitors, number 4s are volume monitors, number 5s are material monitors, number 1s are secretaries and number 2s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Different types of charts Pupils already know about different types of charts, but it is interesting to have a look at them. The teacher shows http://www.bbc.co.uk/schools/ks3bitesize/maths/handling_data/representing_data/revise1.shtml on the screen and goes through pages from 1 to 5 explaining the content and checking comprehension. When there is a question to answer, the teacher gives the groups time to think and discuss about the answer, and the speaker in each group has to say the answer, which is then checked on the screen. The pupils can use whiteboards or scrap paper. They can also use the 'discussion and agreement' language frame. The same process is followed with http://www.bbc.co.uk/schools/ks3bitesize/maths/handling_data/representing_data/activity.shtml doing the first five steps (avoiding the two last steps about constructing pie charts). Note that the subtitles can be on or off.</p>	Whole group Small groups	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Whiteboards and markers or scrap paper and pens • 'Discussion and agreement' language frame – SM p.19-20
<p>Checking charts comprehension Material monitors give each pupil the 'charts' worksheet with some questions to answer, which are projected on the screen</p>	Individual	<ul style="list-style-type: none"> • 'Charts' worksheet – SW p.1-3

<p>http://www.bbc.co.uk/apps/ipl/schools/ks3bitesize/maths/quizengine?quiz=representing_data&templateStyle=maths. They have to answer individually, so, they can check whether they got it or not.</p>		
<p>Homework Pupils take the 'charts homework' worksheet home for doing it individually. This worksheet is available from http://downloads.bbc.co.uk/schools/teachers/ks3bitesize/worksheets/data_recording.pdf</p>	Individual	<ul style="list-style-type: none"> • 'Charts homework' worksheet – SW p.1-5
<p>Extra activities for fast-finishers or for doing at home http://uk.ixl.com/math/year-6/read-a-table http://uk.ixl.com/math/year-7/interpret-pictographs http://uk.ixl.com/math/year-7/create-pictographs http://uk.ixl.com/math/year-6/frequency-charts http://uk.ixl.com/math/year-7/create-frequency-tables http://uk.ixl.com/math/year-7/interpret-bar-graphs http://uk.ixl.com/math/year-7/create-bar-graphs http://uk.ixl.com/math/year-7/interpret-double-bar-graphs http://uk.ixl.com/math/year-7/create-double-bar-graphs http://www.shodor.org/interactivate/activities/BarGraphSorter/ http://pbskids.org/cyberchase/math-games/bugs-in-the-system/ http://www.amblesideprimary.com/ambleweb/mentalmaths/grapher.html</p>		<ul style="list-style-type: none"> •

UNIT: DATA HANDLING		
Lesson: 5 – Line graphs and pie charts	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 4 (A4, B4, C4, D4 and E4) are language monitors, number 5s are volume monitors, number 1s are material monitors, number 2s are secretaries and number 3s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Line graphs The chart with the data about the snacks the pupils had at school during the 2 weeks recorded is projected on the screen. The teacher asks the students whether it is easy to see how many children had one type of snack. The answer is no. So, the teacher suggests they create a line graph to show the results in a clearer way. Pupils, in groups, and looking at the information they have on the screen create a line graph on the computer. Group 1 creates the line graph for fruit, group 2 for sandwich, group 3 for cake (sweet snack), group 4 for 'other' and group 5 for nothing. When all the groups have finished and the graphs are checked by the teacher, the line graphs are projected on the screen. The teacher asks questions about the line graphs and the pupils, in groups, decide the answer and share it with the rest of the class. Sample questions: <i>On which day did more pupils have fruit?</i> <i>On which day did less pupils have fruit?</i> <i>How many pupils had a sandwich on day 3?</i> <i>What is the difference between the highest and the lowest number of pupils who had a cake (sweet snack)?</i></p>	Whole group Group work	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Chart with the 2-week snack register • 5 computers or laptops • 'Discussion and agreement' language frame – SM p.19-20 • 'Comparing' language frame – SM p.25

<p>The teacher can show the pupils a graph (previously prepared) comparing all the lines, or comparing them in twos and ask them questions following the same process. Sample questions: <i>On which days did more pupils have a sandwich than fruit?</i> <i>On which days did less pupils have a cake (sweet snack) than 'other'?</i> <i>On which day was a higher difference between pupils who had a sandwich and those who had a cake (sweet snack)?</i></p>		
<p>Pie charts and percentages The teacher asks pupils whether it is easy to see what percentage of the pupils had a different snack each day of the week. The answer is no. So, she shows them a pie chart with the percentages of the different snacks for the first day and asks them questions like: <i>What is the percentage of pupils who had a sandwich?</i> <i>Is the percentage of pupils who had fruit higher or lower than $\frac{1}{4}$ of the class?</i> <i>What is the percentage of pupils who had fruit or a cake (sweet snack)?</i> <i>If there are 25 pupils in class, how many pupils had nothing?</i> <i>Did more pupils have a sandwich or 'other'?</i> Pupils discuss the answer in groups and share it. They can use the 'discussion and agreement' language frame. The teacher repeats the process with the charts from day 2 to day 5. The teacher asks the pupils to create a chart for the rest of the days on the computer. Group A creates the chart for day 6, group B for day 7, group C for day 8, group D for day 9 and group E for day 10. When groups have finished, the teacher checks the charts and they are projected on the screen.</p>	<p>Whole group Small groups</p>	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Whiteboards and markers or scrap paper and pens • 'Discussion and agreement' language frame – SM p.19-20 • 'Comparing' language frame – SM p.25 • 5 computers or laptops
<p>Extra activities for fast-finishers or for doing at home http://uk.ixl.com/math/year-7/circle-graphs-with-fractions</p>		<ul style="list-style-type: none"> •

http://uk.ixl.com/math/year-7/interpret-line-graphs http://uk.ixl.com/math/year-7/create-line-graphs http://nces.ed.gov/nceskids/createagraph/default.aspx		
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UNIT: DATA HANDLING		
Lesson: 6 – Creating charts	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 5 (A5, B5, C5, D5 and E5) are language monitors, number 1s are volume monitors, number 2s are material monitors, number 3s are secretaries and number 4s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>My snacks pie chart Material monitors hand out 'my snacks pie chart' worksheet with an empty pie chart (with ten marks for making divisions) for each pupil. Looking at the 2-week snack chart projected on the screen, each pupil has to design a pie chart with the percentage of days s/he had each of the different types of snacks and create the key.</p>	Individual	<ul style="list-style-type: none"> • Smartboard or projector and white screen • 'My snacks pie chart' worksheet – SW p.6 • Pens, pencils and coloured pencils.
<p>Creating charts for the questions Pupils, in groups, create a chart on the computer for each of the 5 questions they prepared. They should discuss and agree which type of chart suits better with each type of question. They can use the 'discussion and agreement' language frame. If no computers are available, they can do it on a sheet of paper.</p>	Small groups	<ul style="list-style-type: none"> • 'Discussion and agreement' language frame – SM p.19-20 • 5 computers or laptops

		<ul style="list-style-type: none"> • Chart with all the data each group has gathered
<p>Self-assessment Individually, pupils do a self-assessment of lessons 4, 5 and 6 by means of the 'Self-assessment: Charts' grid. They should punctuate several statements from 0 to 10 (0 is 'I don't agree' and 10 'I absolutely agree'), write 2 stars (strong points or compliments) and 1 wish (one thing they could improve) and if they want to do so, they can write comments. They can also say what they like and don't.</p>	Individual	<ul style="list-style-type: none"> • 'Self-assessment: Charts' grid – SM p.14
<p>Extra activities for fast-finishers or for doing at home http://uk.ixl.com/math/year-7/circle-graphs-with-fractions http://uk.ixl.com/math/year-7/interpret-line-graphs http://uk.ixl.com/math/year-7/create-line-graphs http://nces.ed.gov/nceskids/createagraph/default.aspx</p>		<ul style="list-style-type: none"> •

UNIT: DATA HANDLING		
Lesson: 7 – Absolute and relative frequency	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 1 (A1, B1, C1, D1 and E1) are language monitors, number 2s are volume monitors, number 3s are material monitors, number 4s are secretaries and number 5s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Absolute and relative frequency The teacher projects the absolute and relative frequency ppt and explains how to calculate them by asking the pupils questions. They should have whiteboards or scrap paper and pens for the entire lesson.</p> <p>First of all, the teacher shows the first and second slides of the ppt on the smartboard or white screen.</p>	Whole group Small groups Individual	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Absolute and relative frequency ppt – SM • ‘Frequency’ worksheet – SW p.7-8 • ‘Discussion and agreement’ language frame – SM p.19-20 • Scrap paper and pens or

		whiteboards
<p>1. Count the tally marks. The teacher asks the pupils to count the number of times that each piece of data is repeated. They share their answers with the rest of the class. The answers are checked on the ppt slide. They notice what absolute frequency is.</p>	Whole group	•Ppt: slides 1-4
<p>2. Count the total number of events. The teacher asks the pupils to count the total number of events. They share their answers with the rest of the class. The answers are checked on the ppt slide.</p>	Whole group	•Ppt: slides 5-6
<p>3. Write a fraction. The teacher explains how to write a fraction and asks the pupils to work out the missing fractions. They share their answers with the rest of the class. The answers are checked on the ppt slide. They notice what relative frequency is.</p>	Individual Whole group	•Ppt: slides 7-8 •Scrap paper and pens or whiteboards
<p>4. Divide the numerator by the denominator. The teacher explains how to divide the numerator by the denominator. Pupils calculate the relative frequency. They share their answers with the rest of the class. The answers are checked on the ppt slide.</p>	Individual Whole group	•Ppt: slides 9-11 •Scrap paper and pens or whiteboards •Calculators
<p>5. Add up all the relative frequencies. The teacher asks the pupils what happens if they add up all the relative frequencies. They answer the questions individually. They notice that the sum of all the relative frequencies is the unit.</p>	Individual Whole group	•Ppt: slide 12 •Scrap paper and pens or whiteboards
<p>6. Look at these additions. Can you see any differences? The pupils should look at the additions on the screen and notice that the only difference is the use of 'comma' or 'point' for the decimals. The teacher explains them that it depends on the language spoken in each country.</p>	Whole group	•Ppt: slides 13-14
<p>Let's calculate the relative frequency!</p>	Whole	•Ppt: slide 15

<p>The material monitors hand out the frequency worksheet.</p>	<p>group</p>	<ul style="list-style-type: none"> • 'Frequency' worksheet – SW p.7
<p>1. Count the tally marks. The teacher tries to elicit the process from the pupils. In groups, they look at the information and count the number of times that each piece of data is repeated. Then the speakers share the results with the rest of the class. The answers are checked on the ppt slide. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<ul style="list-style-type: none"> • Ppt: slides 16-19 • Worksheet – SW p.7
<p>2. Count the total number of events. The teacher tries to elicit the process from the pupils. In groups, they count the total number of events. Then the speakers share the results with the rest of the class. The answers are checked on the ppt slide. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<ul style="list-style-type: none"> • Ppt: slides 20-22 • Worksheet – SW p.7
<p>3. Write a fraction. The teacher tries to elicit the process from the pupils. In groups, they write the fractions. Then the speakers share the results with the rest of the class. The answers are checked on the ppt slide. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<ul style="list-style-type: none"> • Ppt: slides 23-27 • Scrap paper and pens or whiteboards • Worksheet – SW p.7
<p>4. Divide the numerator by the denominator. The teacher tries to elicit the process from the pupils. In groups, they calculate the relative frequency. Then the speakers share the results with the rest of the class. The answers are checked on the ppt slide. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<ul style="list-style-type: none"> • Ppt: slides 28-33 • Scrap paper and pens or whiteboards • Calculator • Worksheet –

<p>5. Add up all the relative frequencies. The teacher tries to elicit the answer from the pupils. In groups, they add up all the relative frequencies. Then the speakers share the results with the rest of the class. The answers are checked on the ppt slide. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<p>SW p.7 •Ppt: slide 34 •Scrap paper and pens or whiteboards •Worksheet: p. 1</p>
<p>6. Order the steps of the process to calculate the relative frequency. The material monitors hand out a set of cards with the steps to calculate the relative frequency. In groups, pupils put the steps in order. The speakers share their order with the rest of the class. It is checked with the help of the teacher. Individually, pupils copy the answers in their worksheet.</p>	<p>Whole group Small groups Individual</p>	<p>•Ppt: slide 35 •Worksheet – SW p.8 •Frequency to order worksheet (1 per group): cut up into cards previously – SM p.6</p>
<p>7. In groups, calculate the absolute and relative frequencies for your own data. In groups, pupils look at the data they gathered from the questionnaires and calculate the absolute and relative frequencies for each of their questions. They can use scrap paper or whiteboards. Material monitors hand out a worksheet ('chart to record frequency and average'), where each pupil will record the frequencies and the average for each of the questions his/her group is working with. When they have calculated the frequencies, they write it individually in the chart.</p>	<p>Small groups Individual</p>	<p>•Ppt: slide 36 •Chart with all the data each group has gathered •Scrap paper and pens or whiteboards •'Chart to record</p>

		frequency and average' – SW p.9
<p>Homework Pupils take the 'Frequency Homework' worksheet home for doing it individually. This worksheet is available from http://www.bbc.co.uk/education/mathsfile/printoff_dat.html</p>	Individual	<ul style="list-style-type: none"> • 'Frequency Homework' worksheet – SW p.10
<p>Extra activities for fast-finishers or for doing at home 'Frequency for fast-finishers' worksheets: Two worksheets with 2 different levels, so, pupils can choose which level they can and want to do. Available from http://www.bbc.co.uk/education/mathsfile/printoff_dat.html</p> <p>http://uk.ixl.com/math/year-6/frequency-charts http://uk.ixl.com/math/year-7/create-frequency-tables</p>		<ul style="list-style-type: none"> • 'Frequency for fast-finishers' worksheets – SM p.7-8

UNIT: DATA HANDLING		
Lesson: 8 – Range and median	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 2 (A2, B2, C2, D2 and E2) are language monitors, number 3s are volume monitors, number 4s are material monitors, number 5s are secretaries and number 1s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Finding out about RANGE and MEDIAN Pupils find out about range and median by means of a ppt and worksheets. Within the groups, pupils have to divide themselves in pairs and threes to work during this and the next lesson First of all, the teacher shows the first and second slides of the ppt on the smartboard or white screen. Then, the material monitors hand out the worksheets.</p>	Whole group Pairs or threes	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Ppt: Mean, Median, Mode and Range (Slides 1-15) - SM • Worksheet: Average - SW p.11-14 • Worksheet: Median to order - 1 per each pair (it should be cut up previously) – SM p.9

<p>RANGE 1. Look at this information. Students look at the information and comment on it.</p>	<p>Whole group</p>	<ul style="list-style-type: none"> •Ppt: slides 1 & 2 •Worksheet – SW p.11
<p>2. In pairs, answer these questions: In pairs or threes, students discuss the questions. Then they share with the rest of the class. The answers are checked on the ppt slide.</p>	<p>Pairs or threes Whole group</p>	<ul style="list-style-type: none"> •Ppt: slide 3 •Worksheet – SW p.11
<p>3. Complete this definition. Use some of the words below. Individually, students complete the definition on their worksheet. Then it is shared and checked on the ppt slide.</p>	<p>Individual Whole group</p>	<ul style="list-style-type: none"> •Ppt: slide 4 •Worksheet – SW p.11
<p>4. Look at this data and calculate the range. Individually, students calculate the range. Then it is shared and checked on the ppt slide.</p>	<p>Individual Whole group</p>	<ul style="list-style-type: none"> •Ppt: slide 5 •Worksheet – SW p.12
<p>5. In groups, calculate the range for your own data. In groups, pupils look at the data they gathered from the questionnaires and calculate the range for each of their questions. They can use scrap paper or whiteboards. When they have the answer, they write it individually in the 'chart to record frequency and average'.</p>	<p>Small groups Individual</p>	<ul style="list-style-type: none"> •Ppt: slide 6 •Chart with all the data each group has gathered •Scrap paper and pens or whiteboards •'Chart to record frequency and average' – SW p.9
<p>MEDIAN</p>	<p>Whole</p>	<ul style="list-style-type: none"> •Ppt: slides 7 &

<p>1. Look at this information again. Students look at the information again.</p>	<p>group</p>	<p>8 •Worksheet – SW p.12</p>
<p>2. In pairs, order the data from the lowest to the highest number. Students are given an empty table and small cards with the data, one set for each pair or three ('Median to order' worksheet). In pairs or threes, they put the data in order in the empty table.</p>	<p>Pairs or threes</p>	<p>•Ppt: slide 8 •Worksheet – SW p.12 •Worksheet: Median to order – SM p.9</p>
<p>3. Copy the data in order in this table. The correct order is checked by means of the ppt. Students, individually, copy the data in their table. In pairs they look for the piece of data that is in the middle. It is checked by means of the ppt. The teacher explains the way to calculate what is the piece of data that is in the middle. The teacher asks the students questions to engage them in the learning process.</p>	<p>Whole group Individual Pairs or threes</p>	<p>•Ppt: slides 9 & 10 •Worksheet – SW p.12-13 •Worksheet: Median to order – SM p.9</p>
<p>4. Complete. Use some of the words below. Individually, students complete the definition in their worksheet. Then it is shared and checked on the ppt slide.</p>	<p>Individual Whole group</p>	<p>•Ppt: slides 11 & 12 •Worksheet – SW p.13</p>
<p>5. What is the median of these data? Calculate in pairs. In pairs or threes, students try to calculate the median. They realize that there is a problem. The problem is shared and they say what the possible solutions are. They check the answer on the ppt slide.</p>	<p>Pairs or threes Whole group</p>	<p>•Ppt: slides 13 & 14 •Worksheet – SW p.14</p>
<p>6. In groups, calculate the median for your own data. In groups, pupils look at the data they gathered from the questionnaires and calculate the median for each of their questions. They can use scrap paper or whiteboards.</p>	<p>Small groups Individual</p>	<p>•Ppt: slide 15 •Chart with all the data each group has</p>

<p>When they have the answer, they write it individually in the 'chart to record frequency and average'.</p>		<p>gathered</p> <ul style="list-style-type: none">•Scrap paper and pens or whiteboards•'Chart to record frequency and average' – SM p.9
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UNIT: DATA HANDLING		
Lesson: 9 – Mode and mean	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 3 (A3, B3, C3, D3 and E3) are language monitors, number 4s are volume monitors, number 5s are material monitors, number 1s are secretaries and number 2s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Finding out about MODE and MEAN Pupils find out about mode and mean by means of a ppt and worksheets. Pupils should work in the same pairs and threes as in the last lesson. First of all, the teacher shows the first and second slides of the ppt on the smartboard or white screen. Then, the material monitors hand out the worksheets.</p>	Whole group Pairs or threes	<ul style="list-style-type: none"> • Smartboard or projector and white screen • Ppt: Mean, Median, Mode and Range (Slides 16-45) - SM • Worksheet: Average - SW p.15-20
<p>MODE 1. Look at these frequency charts. Students look at the information and comment on it. In pairs, think what mode is. In pairs or threes, pupils have to discuss and try to agree what a mode is (definition). Then, they share it with the other pair or group of three within the original group of five (A, B, C, D and E) and give their definition. They can use the</p>	Whole group Pairs or threes Small group	<ul style="list-style-type: none"> • Ppt: slides 16-21 • Ppt: slide 22 • Worksheet – SW p.15 • Discussion and

<p>'discussion and agreement' language frame. The speaker shares it with the rest of the class</p>		<p>agreement' language frame – SM p.19-20</p>
<p>2. Let's work it out! Do you know what the mode is? Circle the correct answer. Individually, pupils circle what they think is the correct answer and it is checked on the screen</p>	<p>Whole group Individual</p>	<ul style="list-style-type: none"> •Ppt: slide 23 •Worksheet – SW p.15
<p>3. Check it! In groups, pupils check that the answer given is right.</p>	<p>Small groups</p>	<ul style="list-style-type: none"> •Ppt: slide 24 •Worksheet – SW p.15
<p>4. You can identify the mode from... Pupils look at the different sources from where they can identify the mode, while the teacher comments on it.</p>	<p>Whole group</p>	<ul style="list-style-type: none"> •Ppt: slides 25-30 •Worksheet – SW p.16
<p>5. Look at this frequency chart. Pupils look at the frequency chart and in groups, they think about and discuss the answers. They can use whiteboards or scrap paper and the 'discussion and agreement' language frame. They write the answers on the worksheet individually. The speaker shares the answers with the rest of the class. The answers are checked on the screen.</p>	<p>Whole group Small groups Individual</p>	<ul style="list-style-type: none"> •Ppt: slides 31-32 •Worksheet – SW p.17 •Whiteboards and scrap paper and pens •'Discussion and agreement' language frame – SM

		p.19-20
<p>6. Look at this information again. Pupils look at the information. In pairs or threes they should discuss what the mode is. They write it down on their worksheet. The answers are checked on the screen. Individually, they complete the three pieces of missing information that they have worked out previously. It is checked on the screen.</p>	Whole group Pairs or threes	<ul style="list-style-type: none"> •Ppt: slides 33-35 •Worksheet – SW p.17-18
<p>7. Discuss in groups. What is the mode now? Pupils are given a different set of data. In groups, they have to discuss what the mode is. They can not look at the worksheet. They can use the 'discussion and agreement' language frame. They should find out that there is no repeated number. The speaker shares the conclusion, and it is checked on the screen. They write the answer on their worksheet.</p>	Whole group Small groups	<ul style="list-style-type: none"> •Ppt: slide 36 •Worksheet – SW p.18 •'Discussion and agreement' language frame – SM p.19-20
<p>8. Discuss in groups. What is the mode now? Pupils are given a different set of data. In groups, they have to discuss what the mode is. They can not look at the worksheet. They can use the 'discussion and agreement' language frame. They should find out that there are two numbers repeated 3 times. The speaker shares the conclusion, and it is checked on the screen. They write the answer on their worksheet.</p>	Whole group Small groups	<ul style="list-style-type: none"> •Ppt: slide 37 •Worksheet – SW p.18 •'Discussion and agreement' language frame – SM p.19-20
<p>9. In groups, calculate the mode for your own data. In groups, pupils look at the data they gathered from the questionnaires and calculate the mode for each of their questions. They can use scrap paper or whiteboards.</p>	Small groups Individual	<ul style="list-style-type: none"> •Ppt: slide 38 •Chart with all the data each group has

<p>When they have the answer, they write it individually in the 'chart to record frequency and average'.</p>		<p>gathered</p> <ul style="list-style-type: none"> •Scrap paper and pens or whiteboards •'Chart to record frequency and average' – SM p.9
<p>MEAN 1. Look at this information again. Students look at the information again. In pairs or threes, they follow the instructions given on the slide and the worksheet, so that they see what the mean is. They can use whiteboards or scrap paper and the 'discussion and agreement' language frame. Individually, they write their answers on their worksheets. The answers are checked on the screen.</p>	<p>Whole group Pairs or threes Individual</p>	<ul style="list-style-type: none"> •Ppt: slides 39-41 •Worksheet – SW p.19 •Scrap paper and pens or whiteboards •'Discussion and agreement' language frame – SM p.19-20
<p>2. So, in this table... Individually, pupils complete the four pieces of missing information that they have worked out previously. It is checked on the screen.</p>	<p>Individual Whole group</p>	<ul style="list-style-type: none"> •Ppt: slide 42 •Worksheet – SW p.19
<p>3. What is the mean of these data? Calculate in pairs. Students look at the information. In pairs or threes, they follow the instructions given on the slide and the worksheet to calculate the mean. They can use</p>	<p>Whole group Individual</p>	<ul style="list-style-type: none"> •Ppt: slides 43 & 44 •Worksheet –

<p>whiteboards or scrap paper and the 'discussion and agreement' language frame. Individually, they write their answers on their worksheets. The answers are checked on the screen.</p>	<p>Pairs or threes</p>	<p>SW p.20</p> <ul style="list-style-type: none"> •Scrap paper and pens or whiteboards •'Discussion and agreement' language frame – SM p.19-20
<p>4. In groups, calculate the mean for your own data. In groups, pupils look at the data they gathered from the questionnaires and calculate the mean for each of their questions. They can use scrap paper or whiteboards. When they have the answer, they write it individually in the 'chart to record frequency and average'.</p>	<p>Small groups Individual</p>	<ul style="list-style-type: none"> •Ppt: slide 45 •Chart with all the data each group has gathered •Scrap paper and pens or whiteboards •'Chart to record frequency and average' – SM p.9
<p>Self-assessment Individually, pupils do a self-assessment of lessons 7, 8 and 9 by means of the 'Self-assessment: Frequency and average' grid. They should punctuate several statements from 0 to 10 (0 is 'I don't agree' and 10 'I absolutely agree'), write 2 stars (strong points or compliments) and 1 wish (one thing they could improve) and if they want to do so, they can write comments. They</p>	<p>Individual</p>	<ul style="list-style-type: none"> •'Self-assessment: Frequency and average' grid – SM p.15

<p>can also say what they like and don't.</p>		
<p>Homework Pupils take the 'Average Homework' worksheet home for doing it individually. This worksheet is available from http://downloads.bbc.co.uk/schools/teachers/ks2worksheets/bbc_teachers_ks2_maths_worksheet_mode_median_mean.pdf Pupils look at a set of data and fill in a tally and frequency chart. Then they order the data and calculate the mode, range, median and mean. Finally, they are given an imaginary situation and they create their hypothesis.</p>	<p>Individual</p>	<ul style="list-style-type: none"> • 'Average Homework' worksheet – SW p.21
<p>Extra activities for fast-finishers or for doing at home 'Average for fast-finishers' worksheets: Three worksheets with 3 different levels, so, pupils can choose which level they can and want to do. Available from http://www.bbc.co.uk/education/mathsfle/printoff_dat.html http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/read1.shtml http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/play.shtml http://www.bbc.co.uk/apps/ifl/schools/ks2bitesize/maths/quizengine?quiz=mode_median_mean&templateStyle=maths http://uk.ixl.com/math/year-7/calculate-mean-median-mode-and-range http://uk.ixl.com/math/year-7/interpret-charts-to-find-mean-median-mode-and-range http://uk.ixl.com/math/year-7/mean-median-mode-and-range-find-the-missing-number http://www.bbc.co.uk/education/mathsfle/shockwave/key/trainkey.html http://www.bbc.co.uk/education/mathsfle/shockwave/games/train.html http://www.crickweb.co.uk/assets/resources/meanmachine.swf http://www.crickweb.co.uk/assets/resources/mmsets2.swf</p>		<ul style="list-style-type: none"> • 'Average for fast-finishers' worksheets – SM p.10-12

UNIT: DATA HANDLING		
Lesson: 10 and 11 – Preparing presentations	Timing: 2 hours	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 4 (A4, B4, C4, D4 and E4) are language monitors, number 5s are volume monitors, number 1s are material monitors, number 2s are secretaries and number 3s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Preparing presentations. In groups, pupils prepare their presentations on a ppt. They look at all the information they have gathered, the charts they have created and the calculations they have done (frequency and average) and from all this information, they write a report. They can use the 'discussion and agreement' language frame and the 'reporting' language frame. Once the results have been analyzed, they should look at the advantages and disadvantages of having good and bad habits, and they should think about advice to give to their classmates to improve their habits. They can use the 'giving advice' language frame. The language pupils will need to do the presentation can be elicited from them. When they know about the task they have to do, the teacher asks them to think about the language they will need, they can use their mother tongue. The teacher can write the language in English on a poster or board, in such a way, pupils will identify this as their own language. The teacher should give the pupils the criteria for assessing the presentation. It is a list that they should take into account when preparing their presentation because their peers are going to assess them following these criteria. Pupils can prepare posters for a display in the school corridors. They can use</p>	Small groups	<ul style="list-style-type: none"> • 5 computers or laptops and printer • 'Discussion and agreement' language frame – SM p.19-20 • 'Reporting' language frame – SM p.26 • 'Giving advice' language frame – SM p.27 • Criteria for

<p>everything they have already done: charts, frequency and average calculations, their report, advantages and disadvantages and advice. Posters can be done with kraft paper, glue, coloured pencils and markers.</p>		<p>assessing the presentation ('peer-assessment' grid) – SM p.17</p> <ul style="list-style-type: none"> • Kraft paper, glue, coloured pencils, markers
<p>Extra activities for fast-finishers or for doing at home</p> <p>http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/read1.shtml</p> <p>http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/play.shtml</p> <p>http://www.bbc.co.uk/apps/ifl/schools/ks2bitesize/maths/quizengine?quiz=mode_median_mean&templateStyle=maths</p> <p>http://uk.ixl.com/math/year-7/calculate-mean-median-mode-and-range</p> <p>http://uk.ixl.com/math/year-7/interpret-charts-to-find-mean-median-mode-and-range</p> <p>http://uk.ixl.com/math/year-7/mean-median-mode-and-range-find-the-missing-number</p> <p>http://www.teachingvideos.co.uk/index.php/videos/viewvideo/970/data-handling/mean-median-and-mode-song</p>		<ul style="list-style-type: none"> •

UNIT: DATA HANDLING		
Lesson: 12 - Presentations	Timing: 1 hour	
Activities	Grouping	Materials and resources
<p>The roles All the pupils who have number 5 (A5, B5, C5, D5 and E5) are language monitors, number 1s are volume monitors, number 2s are material monitors, number 3s are secretaries and number 4s are speakers. The teacher, with the help of the pupils and the role cards and number cards, tells the pupils what their role is today. S/he can check comprehension in the way suggested in lesson 1.</p>	Whole group	<ul style="list-style-type: none"> • Role cards – SM p.2-3 • Number cards – SM p.4
<p>Presentations In groups, pupils do their presentations by ppt. The rest of the pupils do peer-assessment by means of the criteria presented in the previous lessons. Each group has a 'peer-assessment' grid that should be discussed and completed at the end of the presentation. For the following lesson, it is a good idea to make a copy for each pupil of the peer-assessment the other groups have done. Each pupil will have four different 'peer-assessment' grids to think about and try to improve.</p>	Small groups	<ul style="list-style-type: none"> • Smartboard or projector and white screen • 'Peer-assessment': criteria for assessing the presentation – SM p.17
<p>Group-assessment In groups, pupils assess their work as a group during the 12 lessons. They should punctuate several statements from 0 to 10 (0 is 'I don't agree' and 10 'I absolutely agree'), write 2 stars (strong points or compliments) and 1 wish (one thing they could improve) and if they want to do so, they can write comments. They can also say what they liked and didn't. They only need one grid per group.</p>	Small groups	<ul style="list-style-type: none"> • 'Group-assessment' grid – SM p.18
<p>Self-assessment Individually, pupils do a self-assessment of lessons 10, 11 and 12 by means of the 'Self-assessment: Our class' grid.</p>	Individual	<ul style="list-style-type: none"> • 'Self-assessment: Our class' grid

<p>They should punctuate several statements from 0 to 10 (0 is 'I don't agree' and 10 'I absolutely agree'), write 2 stars (strong points or compliments) and 1 wish (one thing they could improve) and if they want to do so, they can write comments. They can also say what they like and don't.</p>		<p>– SM p.16</p>
<p>Extra activities for fast-finishers or for doing at home http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/read1.shtml http://www.bbc.co.uk/schools/ks2bitesize/maths/data/mode_median_mean/play.shtml http://www.bbc.co.uk/apps/ipl/schools/ks2bitesize/maths/quizengine?quiz=mode_median_mean&templateStyle=maths http://uk.ixl.com/math/year-7/calculate-mean-median-mode-and-range http://uk.ixl.com/math/year-7/interpret-charts-to-find-mean-median-mode-and-range http://uk.ixl.com/math/year-7/mean-median-mode-and-range-find-the-missing-number</p>		<ul style="list-style-type: none"> •