

# Maths – 60 minutes

## Lesson plan

**Curriculum link:** Explore what can and cannot be inferred in statistical and probabilistic settings and begin to express their arguments formally.

**Learning Objective:** To explore job roles linked to the statistics part of the KS3 maths curriculum

**Learning Outcomes:**

- To understand why knowledge of statistics is necessary for a market research analyst
- To understand how knowledge of statistics can be useful on other job roles

**Success Criteria:**

1. **Describe** – What does an Analyst do?
2. **Understand** – The difference between quantitative and qualitative data and how an Analyst can use statistics to make recommendations to inform decision making.
3. **Analyse** – What kinds of data will be valid and useful for a specific task? What are the pros and cons of different data sources?
4. **Apply** – Analyse survey data and make a recommendation to the council on whether to build a café in the local park
5. **Reflect** – Were there roles or opportunities that interested you?

Timings	Activity	Details	Resources
3 mins	<b>Starter</b> – Reading graphs to identify the relationships between using certain spaces and mental health	<p>Talk through the graph when getting the feedback – what does each bar represent? Is this what you would expect?</p> <p>Take all feedback, but should ultimately land on the message that using the gym even just once each week has an impact on mental health, but using the Woods and Forests helps mental health the more that they are used</p> <p>Source: <a href="https://www.hutton.ac.uk/sites/default/files/files/projects/GreenHealth-Final-Report.pdf">https://www.hutton.ac.uk/sites/default/files/files/projects/GreenHealth-Final-Report.pdf</a></p>	Slide 3 To be printed off if students can't see the board



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3 mins	<p><b>Introduction</b> – What's the problem?</p> <p>Students discuss implications of increasing urbanisation</p>	<p>(1) <b>Read</b> the extract from The New Scientist. For more background read the full article <a href="#">here</a></p> <p><b>Discuss</b></p> <p>(2) What challenges can you see as result of this trend? Use the discussion from the starter to help you.</p> <p>(3) How might this affect priorities for city councils? What kinds of new jobs might be in demand?</p>	Slide 4
15 mins	<p><b>Introduce the challenge &amp; explore the role of analyst</b></p> <p><b>Success criteria b:</b> Describe the role of an analyst and the skills needed</p>	<p>(1) Read the challenge to the students</p> <p>(2) Show the video embedded on slide 6 in the PowerPoint (link <a href="#">here</a>)</p> <p>From start until 1.45secs</p> <p><b>Discuss</b></p> <p>What is the value that Research Analysts can bring to organisations?</p> <p><i>Examples</i></p> <ul style="list-style-type: none"> <li>• Gather data</li> <li>• Convert complex data into easy to understand reports</li> <li>• To help create new products or design marketing campaign</li> <li>• Measure how effective campaigns are</li> <li>• Brainstorm new ways to gather data and find meaningful information</li> </ul>	<p>Slide 5, 6, 7, 8</p> <p>Video x2</p>



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		<p><b>Play the video embedded on slide 7 from 30 seconds to 2 minutes and 30 seconds.</b></p> <p><b>Task</b></p> <ol style="list-style-type: none"> <li>1. In your pairs identify two characteristics of Quant and two characteristics of Qual data</li> <li>2. What are some examples of Quant and Qual data that could be collected by Matt to help the Mayor?</li> </ol> <p>See the facilitator notes for suggested discussion points</p> <p>Move to <b>slide 8</b> and introduce four different types of data for the urban green space challenge.</p> <p><b>Task:</b> Review the different sources of data in your groups. If you could pick just two sources, which would you pick and why? What are the pros and cons of each? What further questions would you have about each data source?</p>	
20 mins (total)	<p><b>Challenge task: becoming an analyst</b></p> <p><b>Success criteria c:</b> Recommend whether the Mayor should build the café</p>	<p><b>Challenge task (15 mins paired activity)</b></p> <p>Slide 9 and 10: introduce the new insight and the Mayor's reaction. Matt is charged with a new challenge.</p> <p>Using worksheet 1 (and slides 11 and 12)</p> <p><b>Task c1:</b> Currently around 200 people use the park each week. Help Matt to calculate the expected weekly use of the café.</p> <p><b>Task c2:</b> Help Matt to analyse the expected annual revenue of a new café, using your calculation from the last task.</p> <p>Process for the maths is in the facilitator notes on slides 11 and 12.</p>	<p>Slide 9, 10, 11, 12, 13, 14</p> <p>Worksheet 1</p>



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		<p><b>Task c3:</b> On slide 13 Talk students through the summary of the information they now have, including that Mark's analysis shows the café will cost £60,000 to operate.</p> <p><b>He is still confident that the city can afford the café. What do the students think?</b></p> <p>Discussion points in the facilitator notes</p> <p><b>Task c4:</b> Slide 14. Summarise the case for the cafe in a 280 character tweet</p>	
10 mins	<p><b>Other roles which are linked to</b></p> <p><b>Success criteria e:</b> Identify different jobs that use and justify their inclusion.</p>	<p>Set the scene: Matt has been working as an analyst for 5 years He enjoys data analysis but thinks that he might want to explore a different career that also uses data analysis.</p> <p>Can you help him decide whether the following job roles would be suitable choices?</p> <p>Give students the selection of job roles and descriptions.</p> <p>Students fill in worksheet 2 to decide if each job role would be suitable for Matt.</p> <p><i>Depending on the class this can be done in one of two ways.</i>  <b>Either:</b>  <i>Teacher uses the accompanying slides to describe the different roles to the whole class. Have a class discussion to think about the answers to the questions, then students fill in the worksheet individually.</i>  <b>OR</b> <i>if students are working at different paces within the class, then give worksheet 2 to students that are ready to start. The worksheet has the same descriptions as the PowerPoint slides so students can use these to make their own decisions and fill in the worksheet.</i></p>	<p>Slides 15-20</p> <p>Worksheet 2</p>
5 mins	<b>Plenary – Reflections</b>	<p>What's your main takeaway from today's lesson?</p> <p>How might you use quantitative and qualitative research in your future?</p> <p>Were there any jobs you hadn't heard of and would like to know more about?</p>	Slide 21



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		What kinds of skills do you think you might need to develop to help you access some of these jobs?	
10 mins	Independent task	<p><b>This independent work can be used in numerous ways:</b></p> <ul style="list-style-type: none"> <li>a) <b>As a homework activity</b></li> <li>b) <b>As a final reflection in groups for students to brainstorm</b></li> <li>c) <b>A longer task using laptops in class to research</b></li> </ul> <p><b>Working for this task</b></p> <p><b><i>Does it make sense to stock organic supplies in the café?</i></b>            If people are willing to pay 20% more for organic, that could amount to around 20% of £60, 000 (if we assume the café breaks even). So <math>0.2 \times 60,000 = £12, 000</math> extra revenue.</p> <p>If the cost of the food supply <b>only</b> is <math>\frac{1}{3}</math> greater than that is equal to <math>0.33 \times 0.5 \times £60,000 = £10,000</math> (because the food is only 50% of the total cost).</p> <p>So according to this calculation the café could make more profit from going organic.</p> <p><b><i>Do we have enough information?</i></b>  <b>NO:</b> we do not know how many people are willing to pay the extra. The slide only says that there is a growing trend.</p> <p><b><i>How might the café think about this strategy over time?</i></b>            One option would be for the café to start with some organic supplies and see how they were received by the customers. It could then increase over time if the market trend continued in favour of paying more for organic.</p>	Slide 22

