Mathematics lesson 2 – Student worksheet

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Learning aim:

To make informed decisions with statistics.

Scenario:

You work at the Local Council and part of your role as a Town Planner is to review applications from traders to take part on your popular weekend market. Part of your responsibility is to make suggestions about which pop-up shops would be best suited to the market, and which would perform better as shops in the local shopping centre. To make these recommendations, you will use statistical measures from the local market and the shopping centre.

Career spotlight:

Town Planners help shape the way towns and cities develop and balance the demands on land with the needs of the community. Responsibilities could include redesigning urban spaces in a sustainable way, preparing and making decisions about planning applications and assessing technical information, data and surveys. Town planners are creative, have knowledge of geography, and they have good problem-solving skills, supported by strong communication and business skills.

Below is the list of traders who have applied for a place on the market:

1. Trainers, specialising in rare editions.
2. Pick'n'mix sweets.
3. Antiques furniture.
4. Children's clothing, for babies and children aged 0-11.
5. Organic fruit and vegetables.

First you will need to review the data tables below for the market and for the shopping centre to help you understand more about who your shoppers are. This will help you to understand what your shoppers will want to see on the market stalls or in the shops.

Data tables

a. Footfall (number of people per hour):

Market	150, 120, 120, 180, 200, 90, 140, 160, 110, 130
Shopping centre	400, 350, 380, 420, 390, 410, 370, 430, 350, 440

b. Age (in years) of people visiting:

Market	25, 30, 28, 35, 29, 27, 33, 26, 32, 31
Shopping centre	40, 38, 45, 42, 37, 41, 39, 44, 36, 43

c. Salary Breakdown

Market (1380 people)

£10,000 - £20,000	45% = 621 people
£20,000 - £30,000	35%
£30,000 - £40,000	15%
£40,000 - £50,000	5%

Shopping Centre (3950 people)

£10-000 - £20,000	20% = 790 people
£20,000 - £30,000	40%
£30,000 - £40,000	30%
£40,000 - £50,000	10%

Questions:

Calculate the range, mean, mode, median, upper quartile and lower quartile for each dataset (footfall, age, and salary breakdown).

1. Footfall

a) Market	b) Shopping Centre
Range:	Range:
Mean:	Mean:
Mode:	Mode:

Median: Median:

Upper Quartile: Upper Quartile:

Lower Quartile: Lower Quartile:

2. Age

a) Market   b) Shopping Centre

Range: Range:

Mean: Mean:

Mode: Mode:

Median: Median:

Upper Quartile: Upper Quartile:

Lower Quartile: Lower Quartile:

3. Salary breakdown (mean, mode and median only)

a) Market (in £)   b) Shopping Centre (in £)

Estimated Mean: Estimated Mean:

Mode: Mode:

Median: Median:

Group Activity:

As a Town Planner you can only allocate 1 stall to the market from the following list; trainers, pick'n'mix sweets, antiques furniture, children's clothing, organic fruit and vegetables.

Discuss:

1. Which would you allocate to the weekend market?
2. What data would you use to justify our decision?

Extension Activity:

A Town Planner also needs to provide support and advise other traders about which other locations, for example the shopping centre, they should consider. Pick one of the other four traders that you think should open a shop at the shopping centre.

1. In a group, create a marketing plan to help with opening the shop. Use the following to help you:

   - Who do you think the potential customers would be for this shop?
   - How would you advise them to communicate to with your potential customers?
   - How should they reach them? For example, on social media, adverts on local transport etc.
   - Which data can you use to help you create the marketing plan?

Criteria for the marketing plan

You should include:

- What are you going to do to market the opening of the shop?

- Why have you chosen to do this?

- How will you incentivise customers to come and visit the shop?

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Notes