Educational Worksheet

Grade 7 Mathematics Worksheet

Organizing and Presenting Data

Name: _____ **Date:** _____ **Class:** _____

Learning Objectives

By the end of this worksheet, you will be able to: - Analyze and interpret data from pie charts, waffle diagrams, scatter diagrams, and histograms - Determine the most appropriate method for presenting different types of data - Solve complex problems involving data organization and presentation - Apply critical thinking to evaluate data representation choices

Instructions

- Show all your working clearly
- Read each question carefully and consider multiple approaches
- For theoretical questions, provide clear explanations with reasoning
- Use mathematical language appropriately

Section A: Theoretical Understanding (20 marks)

1. **Data Representation Theory: A research team collected data about students' favorite subjects across 500 students in a school. They found: Mathematics (125), Science (100), English (75), History (50), Art (75), PE (75).**

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b. **Calculate the angle for each sector if represented in a pie chart. (4 marks)**

Answer: _____

2. **Waffle Diagram Analysis: A waffle diagram uses 100 squares to represent data. If 23 squares represent "Excellent", 45 squares represent "Good", 27 squares represent "Satisfactory", and 5 squares represent "Needs Improvement":**

   a. **What percentage does each category represent? (2 marks)**

   b. **Explain one advantage of using a waffle diagram over a pie chart for this data. (2 marks)**

Answer: _____

Section B: Data Interpretation Puzzles (25 marks)

3. **Scatter Diagram Mystery: A scatter diagram shows the relationship between hours of study (x-axis) and test scores (y-axis) for 20 students. The correlation appears positive but not perfect.**

   a. **If one student studied for 6 hours and scored 85%, and another studied for 8 hours and scored 82%, what might explain this apparent contradiction to the general trend? (3 marks)**

   b. **Design a question you could ask to gather additional data that might explain the scatter in the diagram. (2 marks)**

Answer: _____

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histogram bar for 155-159 cm is 1.5 times taller than the bar for 150-154 cm.

a. **Explain whether this histogram is correctly drawn. Show your reasoning. (4 marks)**

b. **If the total number of students is 40, and the frequencies form a symmetric distribution, determine the possible frequencies for all intervals. (4 marks)**

Answer: _____

Section C: Complex Problem Solving (30 marks)

5. **Multi-representation Challenge: A survey asked 240 people about their preferred method of transportation. The results were: Car (96), Public Transport (72), Walking (48), Cycling (24).**

   a. **Create the calculations needed for both a pie chart and a waffle diagram representation. (4 marks)**

   b. **If you had to present this data to three different audiences: (i) city planners, (ii) environmental activists, (iii) school children, which representation would you choose for each and why? (6 marks)**

   Answer: _____

6. **Data Detective: You're given four different representations of the same dataset but one contains an error:**

   - Pie chart shows: A=90°, B=135°, C=90°, D=45°
   - Waffle diagram shows: A=25%, B=37.5%, C=25%, D=12.5%

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- Table shows: Total=80, A=25%, B=37.5%, C=25%, D=12.5%

a. **Identify which representation contains the error and explain your reasoning. (4 marks)**

b. **Correct the error and show your working. (2 marks)**

Answer: _____

Section D: Advanced Applications (25 marks)

7. **Scatter Diagram Construction: You have collected data on the relationship between temperature (°C) and ice cream sales (units per day): Temperature: 15, 18, 22, 25, 28, 30, 32, 35 Sales: 45, 52, 68, 75, 88, 95, 102, 115**

   a. **Without drawing the scatter diagram, predict the type of correlation and explain your reasoning. (3 marks)**

   b. **If the temperature was 26°C, estimate the ice cream sales and justify your method. (3 marks)**

   Answer: _____

8. **Histogram Intervals Decision: A researcher has collected 100 test scores ranging from 23% to 97%. They need to create a histogram but are unsure about interval width.**

   a. **Compare the advantages and disadvantages of using 5% intervals versus 10% intervals. (4 marks)**

   b. **If the data shows: 5 scores below 40%, 15 scores 40-59%, 35 scores 60-79%, 30 scores**

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marks)

Answer: _____

9. **Critical Analysis: A company claims their new product has "dramatically improved customer satisfaction" and shows a pie chart where "Very Satisfied" takes up 40% of the chart.**

    a. **List three important pieces of information missing from this presentation that would help you evaluate their claim. (3 marks)**

    b. **Suggest how scatter diagrams or histograms might provide better evidence for their claim. (3 marks)**

Answer: _____

10. **Data Transformation Challenge: Convert this frequency table into the format needed for each representation:**

Score Range	Frequency
0-19	3
20-39	7
40-59	15
60-79	20
80-100	5

    a. **Calculate what you need for a pie chart representation. (3 marks)**

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b. **Explain why a waffle diagram might be challenging for this data and suggest a modification. (3 marks)**

Answer: _____

Total: _____ / 100 marks

Self-Assessment

- I can choose appropriate data representations: □ Confident □ Mostly □ Need practice
- I can interpret complex data displays: □ Confident □ Mostly □ Need practice
- I can solve theoretical data problems: □ Confident □ Mostly □ Need practice
- I can critically evaluate data presentations: □ Confident □ Mostly □ Need practice

Key Methods to Remember

- **Pie Chart**: Best for parts of a whole, angles = (frequency/total) × 360°
- **Waffle Diagram**: Visual percentages using 100 squares for easy interpretation
- **Scatter Diagram**: Shows correlation between two continuous variables
- **Histogram**: Displays frequency distribution of continuous data with connected bars

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