Grouped Data Worksheet – Estimated Mean & Percentage (Small Items)

Solved Example

Egg weights last month

Class (g)	40–50	50–60	60–70	70–80
Frequency	27	30	16	7
Total	-	-	-	**80**

a) Estimate the mean (use class midpoints): - Midpoints (g): 45, 55, 65, 75 - $\bar{x} \approx \frac{27 \cdot 45 + 30 \cdot 55 + 16 \cdot 65 + 7 \cdot 75}{80} = \frac{4430}{80} = 55.375\,\text{g} \approx 55.4\,\text{g}$

b) Small eggs are those $\leq$ **53 g**. Estimate % small (assume uniform distribution in a class): - Entire 40–50 class (27 eggs) are small. - In 50–60 class, the portion up to 53 g is $\frac{53-50}{10} = 0.3$ of that class $\Rightarrow 0.3 \times 30 = 9$ eggs. - Estimated small = 27 + 9 = 36 eggs out of 80 $\Rightarrow \frac{36}{80} \times 100\% = 45\%$.

Practice Questions (Estimate; show working)

For each, (a) estimate the **mean** using midpoints; (b) items are **small** if their weight is $\leq$ **the threshold** shown—estimate the **percentage** that are small (assume uniformity in each class).

1. The table shows the weights of eggs collected last month. Classes (g): 50-60 | 60-70 | 70-80 | 80-90 Frequencies: 32, 21, 9, 16 (Total = 78) a) Estimate the mean weight. b) Items are classified as small if they weigh 77 g or less. Estimate the percentage classified as small.

2. The table shows the weights of apples collected last month. Classes (g): 40-50 | 50-60 | 60-70 | 70-80 Frequencies: 23, 19, 26, 14 (Total = 82) a) Estimate the mean weight. b) Items are classified as small if they weigh 55 g or less. Estimate the percentage classified as small.

3. The table shows the weights of mangoes collected last month. Classes (g): 30-40 | 40-50 | 50-60 | 60-70 Frequencies: 34, 12, 26, 26 (Total = 98) a) Estimate the mean weight. b) Items are classified as small if they weigh 66 g or less. Estimate the percentage classified as small.

4. The table shows the weights of lemons collected last month. Classes (g): 20-30 | 30-40 | 40-50 | 50-60 Frequencies: 21, 26, 13, 11 (Total = 71) a) Estimate the mean weight. b) Items are classified as small if they weigh 38 g or less. Estimate the percentage classified as small.

5. The table shows the weights of tomatoes collected last month. Classes (g): 50-60 | 60-70 | 70-80 | 80-90 Frequencies: 27, 20, 26, 22 (Total = 95) a) Estimate the mean weight. b) Items are classified as small if they weigh 68 g or less. Estimate the percentage classified as small.

6. The table shows the weights of pears collected last month. Classes (g): 50-60 | 60-70 | 70-80 | 80-90 Frequencies: 26, 17, 32, 23 (Total = 98) a) Estimate the mean weight. b) Items are classified as small if they weigh 77 g or less. Estimate the percentage classified as small.

7. The table shows the weights of potatoes collected last month. Classes (g): 40-50 | 50-60 | 60-70 | 70-80 Frequencies: 30, 23, 15, 9 (Total = 77) a) Estimate the mean weight. b) Items are classified as small if they weigh 69 g or less. Estimate the percentage classified as small.

8. The table shows the weights of oranges collected last month. Classes (g): 20-30 | 30-40 | 40-50 | 50-60 Frequencies: 31, 20, 32, 34 (Total = 117) a) Estimate the mean weight. b) Items are classified as small if they weigh 39 g or less. Estimate the percentage classified as small.

9. The table shows the weights of peaches collected last month. Classes (g): 30-40 | 40-50 | 50-60 | 60-70 Frequencies: 20, 30, 30, 14 (Total = 94) a) Estimate the mean weight. b) Items are classified as small if they weigh 67 g or less. Estimate the percentage classified as small.

10. The table shows the weights of plums collected last month. Classes (g): 30-40 | 40-50 | 50-60 | 60-70 Frequencies: 11, 31, 17, 21 (Total = 80) a) Estimate the mean weight. b) Items are classified as small if they weigh 39 g or less. Estimate the percentage classified as small.

11. The table shows the weights of eggs collected last month. Classes (g): 20-30 | 30-40 | 40-50 | 50-60 Frequencies: 14, 29, 33, 20 (Total = 96) a) Estimate the mean weight. b) Items are classified as small if they weigh 52 g or less. Estimate the percentage classified as small.

12. The table shows the weights of eggs collected last month. Classes (g): 40-50 | 50-60 | 60-70 | 70-80 Frequencies: 19, 15, 9, 22 (Total = 65) a) Estimate the mean weight. b) Items are classified as small if they weigh 76 g or less. Estimate the percentage classified as small.

13. The table shows the weights of eggs collected last month. Classes (g): 40-50 | 50-60 | 60-70 | 70-80 Frequencies: 16, 14, 19, 3 (Total = 52) a) Estimate the mean weight. b) Items are classified as small if they weigh 63 g or less. Estimate the percentage classified as small.

14. The table shows the weights of eggs collected last month. Classes (g): 30-40 | 40-50 | 50-60 | 60-70 Frequencies: 34, 31, 25, 13 (Total = 103) a) Estimate the mean weight. b) Items are classified as small if they weigh 59 g or less. Estimate the percentage classified as small.

15. The table shows the weights of eggs collected last month. Classes (g): 20-30 | 30-40 | 40-50 | 50-60 Frequencies: 27, 8, 12, 21 (Total = 68) a) Estimate the mean weight. b) Items are classified as small if they weigh 58 g or less. Estimate the percentage classified as small.