

Grouped Frequency Tables

Table categories contain **grouped** values instead of individual values. The frequency data includes all students whose height falls into that specific category.

Table showing the height of students in a class

| | | | | | | | |
|-------------|---------|---------|---------|---------|---------|------------|------------------|
| Height (cm) | 141-145 | 146-150 | 151-155 | 156-160 | 161-165 | ≥ 166 | ← Grouped values |
| Frequency | 2 | 3 | 4 | 5 | 6 | 2 | |

Example

A student who is 153cm tall will be recorded against as being in the category 151-155cm.

When using grouped frequency tables you will need to be able to identify the class boundaries and mid-interval values.

| | | Example |
|--------------------------------|---|---|
| Grouped frequency table | frequency table that using grouped values | 141-145cm |
| Class boundaries | the exact values where one group becomes the next | 145.5cm is the point between 145cm and 146cm |
| Mid-interval values | the mid-point of the group values (that's the scale not the data) | 142.5cm is the mid-point of the group 141-145cm |

Averaging group frequencies

Estimating the mean

Grouped frequency tables do not contain the original values. They tell you “how many” fell into that category. To calculate the mean you would require actual values so when using grouped data you will need to **estimate** the **mean using the mid-interval (average) values** for each group.

Table showing the height of students in a class

| Height (cm) | 141-145 | 146-150 | 151-155 | 156-160 | 161-165 | Totals |
|----------------------------|---------|---------|---------|---------|---------|-------------|
| a Frequency | 2 | 3 | 4 | 5 | 6 | 20 |
| b Mid-interval value | 143 | 148 | 153 | 158 | 173 | -- |
| Frequency value (a x b) | 286 | 444 | 612 | 790 | 1038 | 3170 |

| | Definition | Definition when using frequencies | Average height |
|---------------------------|--|---|------------------|
| Mean | Sum of the items divided by the number of items | total frequency values divided by total frequency $3170 / 20 = 158.5\text{cm}$ | 158.5cm |
| Mode (modal group) | The value that occurs most commonly in the list | frequency with the highest value the group with the highest frequency is called the modal group . the group 161-165 has the greatest number of students (6) | 161-165cm |
| Median | Total number of items (n + 1) divided by 2 | total frequency + 1 divided by 2 $(20 + 1) / 2$ $21 / 2 = 10.5$ Remember Now find the 10.5th value! $2 + 3 = 5$ $2 + 3 + 4 = 9$ $2 + 3 + 4 + 5 = 14$, so the 10.5 th value falls in the 4 th group: 156-160cm. | 156-160cm |