**9 AIL Targeted Teaching Mathematics - Takeaway**

**Histograms and Dot Plots**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Advisory \_\_\_\_\_\_ TT Teacher\_\_\_\_\_\_\_\_

**T2 Teaching Focus**

***Histograms*** and ***Dot Plots*** are ways of representing **Numerical Values** (numbers) **Graphically** (with pictures). They both have similarities to **Column Graphs** in that they show **Frequency** of mathematical events. The key difference to column graphs is that they show **Continuous Data** instead of **Categorical Data.**

**T2 Teaching Example**

Below is a data table for student height (in cm) for an imaginary maths group

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 160 | 147 | 150 | 162 | 170 | 143 | 172 | 139 | 155 |
| 160 | 158 | 158 | 149 | 151 | 153 | 164 | 146 | 158 |
| 157 | 155 | 159 | 166 | 146 | 157 | 160 | 164 | 166 |

When creating either a dot plot or histogram the first step is placing the numbers in order.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 139 | 143 | 146 | 146 | 147 | 149 | 150 | 151 | 153 |
| 155 | 155 | 157 | 157 | 158 | 158 | 158 | 159 | 160 |
| 160 | 160 | 162 | 164 | 164 | 166 | 166 | 170 | 172 |

We create frequency tables of the data and then we can represent the data graphically These frequency tables include values that have a frequency of zero. We can plot the frequency of each one of these different numbers individually. For a histogram we represent the data with a rectangle whose size relates to the frequency

**Frequency table for student heights (cm)**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Number | Frequency | Number | Frequency | Number | Frequency | Number | Frequency |
| 139 | 1 | 148 | 0 | 157 | 2 | 166 | 2 |
| 140 | 0 | 149 | 1 | 158 | 3 | 167 | 0 |
| 141 | 0 | 150 | 1 | 159 | 1 | 168 | 0 |
| 142 | 0 | 151 | 1 | 160 | 3 | 169 | 0 |
| 143 | 1 | 152 | 0 | 161 | 0 | 170 | 1 |
| 144 | 0 | 153 | 1 | 162 | 1 | 171 | 0 |
| 145 | 0 | 154 | 0 | 163 | 0 | 172 | 1 |
| 146 | 2 | 155 | 2 | 164 | 2 |  |  |
| 147 | 1 | 156 | 0 | 165 | 0 |  |  |

**Histogram of all data points**

For a dot plot we represent each value with a dot instead of a rectangle.

**Dot Plot of all data points**

**Student Height**

0

1

2

3

4



**Height (cm)**

**Frequency**

We can also find frequencies for the numbers when they are grouped into 10s (or other groupings).

**Frequency table for grouped data points**

|  |  |
| --- | --- |
| Numbers | Frequency |
| 130-139 | 1 |
| 140-149 | 5 |
| 150-159 | 11 |
| 160-169 | 8 |
| 170-179 | 2 |

**Histogram of grouped data points**

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**Touch Base Tasks:**

Show working where possible.

1. Here is a data set for rainfall in mm in the month of November 2001

3, 1, 0, 0, 0, 0, 2, 0, 0, 3, 0, 0, 0, 7, 1, 1, 0, 3, 8, 0, 0, 7, 6, 3, 0, 3, 1, 0, 0, 2

Sort the data in ascending order

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

Create a Frequency table from the sorted data

|  |  |
| --- | --- |
| Number | Frequency |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Plot a dot plot for this data on the axis below

Plot a histogram of this data on the axis below

2. Here is grouped data for the number of games played by Sydney Swans players at the beginning of the 2010 season.

|  |  |
| --- | --- |
| Number of Games | Frequency |
| 0 – 39 | 22 |
| 40 – 79 | 7 |
| 80 – 119 | 7 |
| 120 – 159 | 3 |
| 160 – 199 | 2 |
| 200 – 239 | 3 |
| 240 – 279 | 1 |

Plot a Histogram for this data

**These tasks will be reviewed in the Tutorial Session in the next Maths Targeted Teaching Time**