

## Using GeoGebra to Explore Distributions

### Learning Outcomes:

Leaving Certificate Syllabus page 21

1.6 Students should be able to

- explore** the distribution of data
- compare** data sets using appropriate displays
- determine the relationship** between variables using scatterplots
- make predictions** based on the line of best fit (HL)
- recognise the existence of outliers
- recognise the effect of outliers (HL)

1.7 Students should be able to

- interpret** a histogram in terms of distribution of data
- **make decisions** based on the empirical rule

### Learning Intention:

Today we are learning to analyse datasets.

### Success Criteria:

I have used GeoGebra to

- create a histogram for my chosen dataset.
- display the statistics for my chosen dataset.
- record the mean and standard deviation.
- calculate the probability of my assigned values
- display two datasets using a scatter plot
- Describe the strength of the relationship between these datasets

## Activity 1 - The Empirical Rule Task A

Open the GeoGebra file: <https://www.geogebra.org/classic/uzjaxfwq>

### **Question 1**

Select Column A (Female Foot Length) and create a histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

**Tip:** Find the  $\Sigma x$  button to generate the relevant statistics for the chosen histogram.

What is the probability of choosing a female with a foot length between

1. 21 and 27cm?
2. 18 and 30 cm?
3. 15 and 33 cm?

Give your answers correct to 2 decimal places.

**Tip:** Select the 'Probability Calculator' view to quickly find these probabilities.

### **Question 2**

Select Column C (Male Foot Length) and create a new histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

What is the probability of choosing a Male with a foot length between

1. 23 and 31 cm?
2. 19 and 35 cm?
3. 15 and 39 cm?

Give your answers correct to 2 decimal places.

### **Question 3**

Describe the relationship between the female's height and female's foot length.

**Tip:** Use the two-variable analysis tool.

## Activity 1 - The Empirical Rule

## Task B

Open the GeoGebra file: <https://www.geogebra.org/classic/j8mub4jf>

### **Question 1**

Select Column C (Height) and create a histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

**Tip:** Find the  $\Sigma x$  button to generate the relevant statistics for the chosen histogram.

What is the probability of choosing a student with a height between

1. 146 and 174 cm?
2. 132 and 188 cm?
3. 118 and 202 cm?

Give your answers correct to 2 decimal places.

**Tip:** Select the 'Probability Calculator' view to quickly find these probabilities.

### **Question 2**

Select Column D (Arm Span) and create a new histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

What is the probability of choosing a student with an arm span between

1. 143 and 175 cm?
2. 127 and 191 cm?
3. 111 and 207 cm?

Give your answers correct to 2 decimal places.

### **Question 3**

Describe the relationship between the height and arm span of the students.

**Tip:** Use the two-variable analysis tool.

## Activity 2 - Exploring Distributions

### Task C

Open the GeoGebra file: <https://www.geogebra.org/classic/dxevw97p>

#### **Question 1**

Select Column A (Index Finger Length) and create a histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

**Tip:** Find the  $\Sigma x$  button to generate the relevant statistics for the chosen histogram.

#### **Question 2**

Select Column B (Ring Finger Length) and create a histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

#### **Question 3**

Select Column C (Left Foot Length) and create a histogram.

- What is the mean?
- What is the standard deviation?

Give your answers correct to the nearest whole number.

#### **Question 4**

Describe the shape of each distribution.

#### **Question 5**

Describe the relationship between the index finger and ring finger lengths of the students.

**Tip:** Use the two-variable analysis tool.

#### **Question 6**

Describe the relationship between the index finger length and the left foot length of the students.