**Physics 1.1 AS 90935 Investigation leading to linear relationship**



Processing the Data

**Success Criteria:** We know we have achieved this when we can:

* Construct a line graph from given data
* Make sure your line graph has the following features; line of best fit, title, labels, units
* Understand that the relationship of variables can be written as a mathematical equation
* Calculate the gradient in a line graph

**1.** Make the **headings for the data table** (in the shaded boxes) below from the following Aim: How does the length of string on a bob of a pendulum, affect the time for one complete swing?

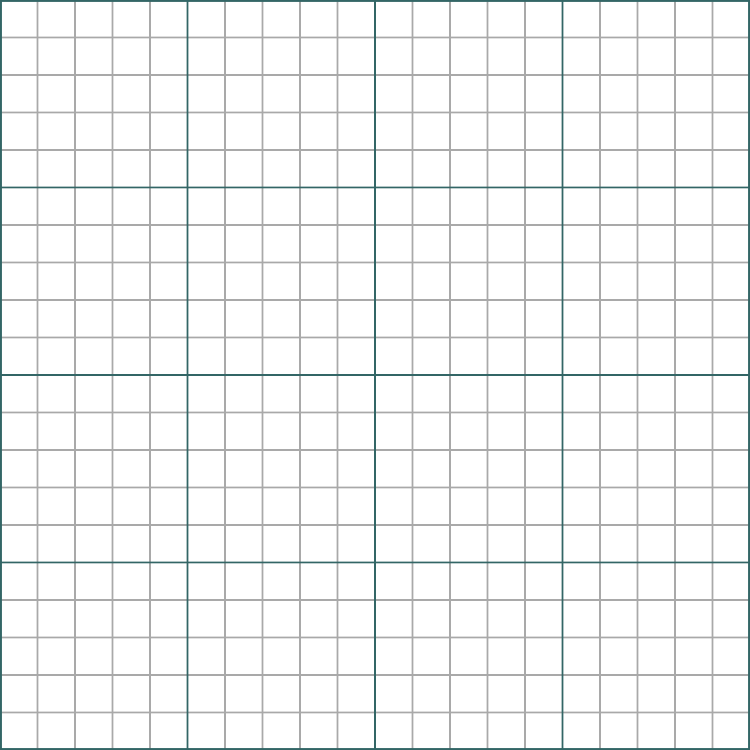
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | | | |
| Trial 1 | Trial 2 | Trial 3 | Average |
| 10cm | 0.7s | 0.7s | 0.8s |  |
| 15cm | 0.8s | 0.9s | 0.9s |  |
| 20cm | 1.3s | 1.3s | 1.4s |  |
| 25cm | 1.5s | 1.5s | 1.6s |  |
| 30cm | 1.8s | 3.8s | 1.9s |  |

**2.** From the data above which of the values does not appear to look correct? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

When a value looks much different from what an expected value it is called an **outlier** and we remove it by placing a line through it.

**3.** Average the following data in the table above. (After removing the outlier)

**4.** Using the following information draw a line graph below. Include title, line of best fit, labels and units



**5.** Calculate the gradient from the graph above using the following formula



* Remember the y axis will be the dependent variable
* The x axis will be the independent variable
* Select a good length of the straight line to calculate the gradient
* Do not start the gradient at 0,0

**6.** The relationship of the variables is stated as a mathematical equation **Y = gradient x X + intercept**

Write the equation for the line above.

**7.** A conclusion looks for patterns in collected data from an investigation. Both the variable that is changed (independent) and the variable that is measured (dependant) **must be included in the conclusion statement**.

The **data is used as evidence** in the conclusion. Write a conclusion for the investigation above.

