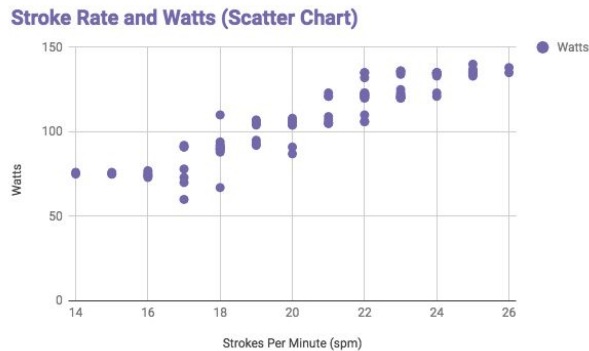


Investigating Consistency and Scatter Charts v 1.0



Introduction

In this activity you will be investigating how we use scatter plots to help us understand relationships between different measurements. You will be asked to plot various data on a scatter plot and determine the relationship between them.

Pre-Activity

Before doing this activity, you should be well warmed up before attempting the exercise portion of this activity.

Activity

After a good warm up set your machine up for a 500m distance. For each 100m segment of your row you will row at the following rates. Ensure that your phone is running the app ErgData so that it records all of your strokes. Try to row as consistently as possible in each segment of your 500m row.

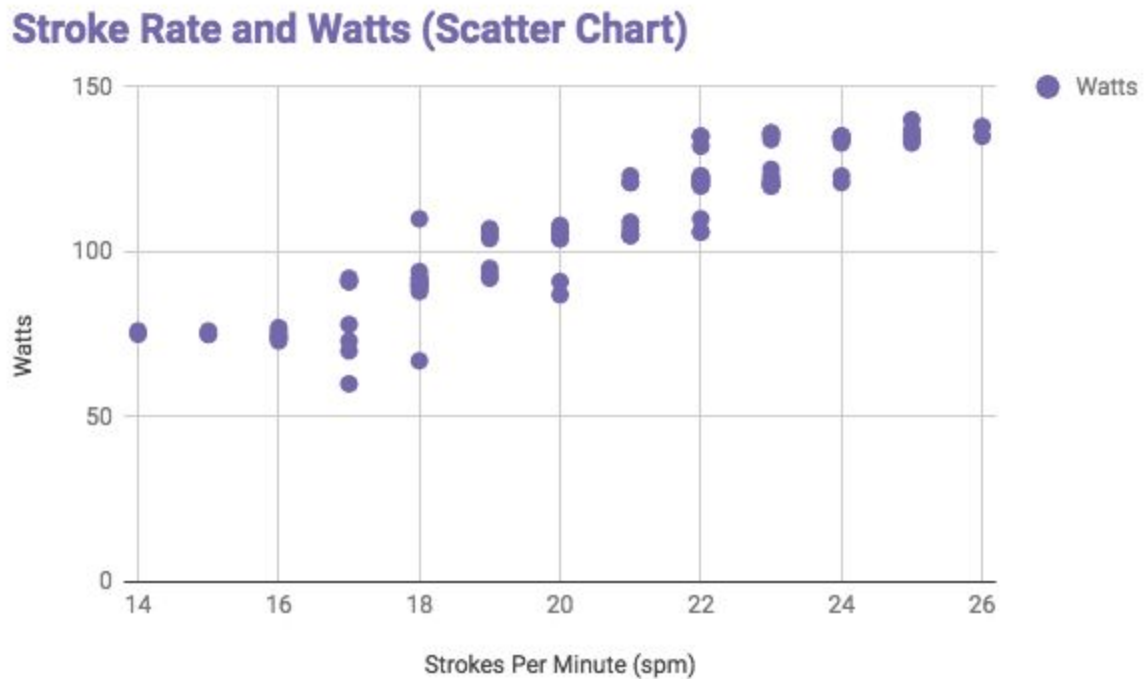
Distance	Stroke Rate
0 - 100m	16
100m - 200m	18
200m - 300m	20
300m - 400m	22
400m - 500m	24

After you have finished rowing your piece, upload your data to the Concept 2 logbook. Once you have uploaded the data, then download the data in the CSV format.

Processing the Data

- 1) After you have downloaded the data, delete all of the data columns EXCEPT watts and stroke rate.
- 2) Using your cursor select all of the data in both columns except the first row (contains watts and stroke rate).
- 3) With the data cells selected now perform Select File >> Chart.
- 4) On the right hand side of the screen change the chart type to scatter plot with the drop down menu.
- 5) Click the Customize tab and select Chart and Axis Titles. Determine if watts is plotted on the x or y axis. Type "Watts" into the axis title for the appropriate axis. Perform the same for stroke rate by changing the drop down and typing in stroke rate (Strokes per minute).
- 6) Choose Chart Title and type in a suitable title for your graph.

Once the above steps are complete the graph should look like this. Your data points will be different.



Analyzing The Data

- 1) Look at your graph. What do you notice about how closely grouped your data points are. What does the relative distance between your data points communicate about the consistency that you rowed this piece?
- 2) Click on the three dots located in the top right hand corner of your scatter chart. Select Edit Chart. Click customize and then Series. Now select the trend line checkbox.
- 3) What is the relationship between stroke rate and watts?

To determine the how reliable a trend is in statistics the R^2 squared value is used. The value usually ranges between 0 and 1. The closer the value of R^2 to 1 the greater the relationship or correlation is between the two variables.

4) Click on the three dots located in the top right hand corner of your scatter chart. Select Edit Chart. Click customize and then Series. Now select the R^2 option.

5) Write down the value for R^2 below.

6) Does you value of R^2 indicate that there is a strong relationship between your power output (Watts and Stroke Rate)? Write down your thoughts in the space provided below.

Optional Extension

Now that you have completed this experiment. Repeat the experiment again and compare your results to your first effort. Perform the same data analysis and determine if you rowed more consistently the first time or the second time.

Concluding Questions

Why is it important that we understand the relationships between two variables? Think of a real-world example where this type of analysis would be useful. Write down your thoughts in the space provided below.