SUBJECT: Scatter Graphs (or Scatter diagrams)

KEY-WORDS: Graphs, axis, units, data
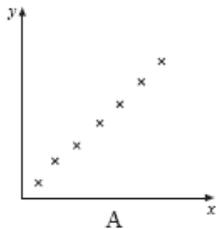
LINK-WORDS: correlation, line of best fit
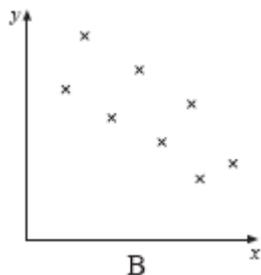
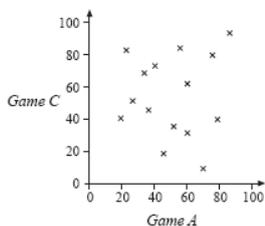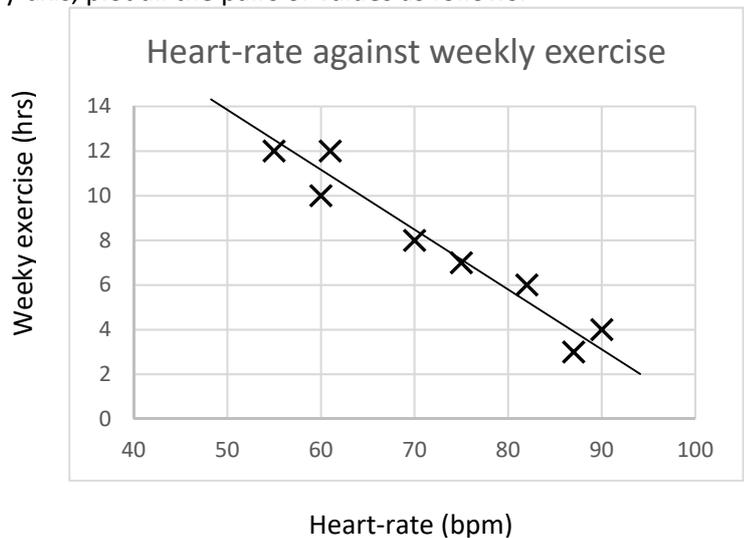| NOTES	EXAMPLE
On a scatter graph, points are plotted to show the relationship (if any) between two sets of quantitative (numbers) data. The points are not joined to each other and you can have more than one point on the same x or y value. It is the pattern created that shows the type of relationship or CORRELATION between the two sets of data. If the pattern is an upward trend both sets of data increase together, so there is a POSITIVE CORRELATION. If the pattern is a downward trend, one data set decreases as the other increases, so there is a NEGATIVE CORRELATION. If there is no obvious pattern, then there is NO CORRELATION.	<table><tr><td>Heart-rate (bpm)</td><td>70</td><td>90</td><td>82</td><td>61</td><td>60</td><td>55</td><td>87</td><td>75</td></tr><tr><td>Weekly exercise (hrs)</td><td>8</td><td>4</td><td>6</td><td>12</td><td>10</td><td>12</td><td>3</td><td>7</td></tr></table> Using the heart-rate for the x-axis, and the weekly exercise for the y-axis, plot all the pairs of values as follows: You can clearly see that there is a negative correlation here – as the weekly exercise goes up, the resting heart-rate goes down. It is possible to draw a "line of best fit" to estimate the relationship as a line or curve. This can be done in various ways, the simplest being drawn just "by eye" and having the same number of points on either side. For a little more accuracy, you could calculate the mean of both sets of data and make sure your line passes through this "extra" point. The line of best fit can then be used to estimate an expected value on one axis from a value on the other – eg 10hrs to 64bpm.
Dos Make sure that your scales are suitable (do not have to start at zero). Remember that your line of best fit may well be slightly different to someone else'	**DON'Ts** Don't join up the points. This is only done with a line graph, which shows (for example) change over a period of time.

RELEVANT SUBJECTS	EXAMPLES and LINKS
Sciences, social sciences	http://www.bbc.co.uk/schools/gcsebitesize/maths/statistics/scatterdiagramsrev1.shtml